The Builder.

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ILLUSTRATIONS.

Stockport Town Hall Competition: First Premiated Design—
Perspective View
Plans
} By Mr. A. Brumwell Thomas.

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Notes on Harbour Works and Harbour Plant.

I.

THERE are few subjects which are of greater importance to commercial nations than that of the possession of harbours and docks, at once safe and commodious. The old ramshackle jetties, piers, and docks which accommodated the commerce and the ships of a generation or two ago are no longer of much use. Only eleven years ago there were but two liners afloat of over 10,000 tons register, now there are more than sixty. Merchant tonnage has also increased in size, including that of sailing vessels. In the present trade rivalry, the largest and safest harbours and the biggest docks will draw the dues of the big ships. For several years past there has been a steady growth of enterprises of this character of a national or of a private character, familiar examples being Peterhead, Dover, Barry, Southampton, Colombo, Vera Cruz, and South-East African ports. The subject, therefore, deserves wider notice than is usually accorded to it in the technical Press.

The work of harbour making, and that of wharves, piers, quay walls, etc., involving submarine foundations, has been completely revolutionised since the introduction of concrete into this class of construction. Rubble formed the foundation of earlier works of this kind, and after the rubble thrown in had acquired its proper height and natural slope, hewn stone was used for facings. Rubble is still used frequently in crib work, for filling in between the skeleton framings of timber, or steel, and for filling in between sheet piling. But concrete has displaced it for by far the largest proportion of contractors' submarine work, and stone is now chiefly employed for facings.

The forms in which concrete are used are various, including squared moulded blocks, made, and allowed time to set on shore, and deposited in the sea with the aid of cranes; and masses of concrete, which, enclosed in bags or in sail cloth, are deposited in a semi-plastic condition to set hard below the sea. For many purposes, including the making of solid masses and the bonding together of such masses, and for repairs, liquid concrete or grouting is poured in.

Each of these methods employed by the engineer is varied by the circumstances of individual cases. The question is partly one of cost of plant. Generally the preference is given to solid cubical blocks of concrete, set and hardened on shore, and deposited like masses of masonry. The great objection to this method in many cases is the expense of the cranes and plant, and sometimes also in the large yard room required for storage. If the magnitude of the work justifies the expense, it is undoubtedly the best method to adopt, and numerous examples of this may be seen round our coasts, as well as in colonial and foreign ports and harbours.

But the methods just now enumerated overlap, and each will find a place in many works. In the case of an extensive pier or mole, the facings may be of masonry cast on concrete blocks, and be laid first, leaving a central space to be filled up with rubble, or with plastic concrete, or with rubble and grouting. Or sheet piling may be used, and the space between filled up thus. To a certain extent the proximity or otherwise of a good supply of rubble or of shingle and sand will determine the choice of methods.

Bag work again fills a useful place, as affording a simple means by which a level foundation can be prepared without grabbing, on which to deposit square blocks of concrete. It also takes the place of rubble in protecting exposed work from the action of the sea, or the scour of currents. To the casual observer one pier, quay, or wharf looks much like another when complete. But from the point of view of the engineer and contractor, there are scarcely two exactly alike, so greatly does the difference in natural conditions, in various localities, entail differences in methods of construction.

The machinery which is employed on these works varies much, both in character and extent. In some instances local authorities are too poor, or the volume of shipping trade done is so small that the engineers are compelled to execute the works with the closest economy. In others wealthy corporations or Governments sanction a lavish expenditure, which permits the use of the most costly plant. The latter, however, on big works may be, and often is, the most economical in the end, as for instance when the work extends over several years, and at the termination of the contract much of the plant has a good market value.

The principal types of machines and plant used in harbour, pier, and breakwater work are the following:—

1. *Excavating Machines.*—These comprise numerous forms of grabs, which are operated by cranes; the excavators so called, or steam shovels, dredger boats, hopper barges, pumps, diving bells, etc. Grabbing is often done within cassions or foundation cylinders, as well as in the open water, and concrete is frequently deposited within foundation cylinders, while cylinders are in some cases of concrete. Besides these there is pile work, both in timber and in iron, which is, however, adopted to but a limited extent when concrete is the material employed for marine structures.

2. *Machines for Mixing and for Moulding Concrete.*—These vary in capacity and output, and in methods of action. They are rotating machines, which throw the materials across from one side to the other, so producing complete amalgamation of the ingredients. They are also fixed, and portable; hand, steam, and electrically operated; some are intermittent. some continuous in action. Adjuncts of the concrete mixers are the skips used in dropping the ingredients into the mixers. The block moulds in which the concrete is deposited form a bulky part of the plant.

They are of wood, and are made like big core boxes. In them the concrete sets in cubical shape, with provision for holes, or in some cases for masonry facings. Trucks are required on which the blocks are transferred to the sea front. Lewis bars, or clips, are employed in lifting the blocks by the cranes. If bag work is adopted, there are the jute bags, within which the concrete is deposited, and drop bottom skips, or side skips, capable of holding and dropping one bag at a time. Or the hopper barge is used, with a central opening large enough to drop one bag through.

3. *The Machinery for Transporting and Depositing Concrete.*—This is the most important and expensive part of the plant employed in this class of work. Here the greatest differences are found in the capital outlay for public works, as anyone who has seen the immense Goliaths and Derricks at Dover, or the Titans at Newcastle or Peterhead can well understand. The machines comprise Goliath cranes, for hauling and stacking concrete blocks in the block yard; and in some works the same class of crane is employed for the deposition of the blocks in the sea. But in many instances the Titan is employed for the latter work, and the Goliath only in the block yard. Derrick cranes are also used to a large extent for block setting. Some piers have been built with derricks alone, in others, as at Dover, the derrick only builds out the staging at the sea front, and prepares the tracks for the Goliaths to follow. In other cases again, the derrick has been used as a side-setting machine only.

In the work of deposition, as in that of foundations, the diver plays an indispensable part. No great harbour work can be undertaken without divers. They examine the ground, and report, often level it in a diving bell, guide concrete blocks into their proper position, locate faults, and are responsible for all that goes on under water. They are an expensive item in many works.

4. *Miscellaneous Appliances and Plant.*—The harbour contractor has to provide an immense amount of machinery and plant which are only indirectly associated with the work of concrete setting. Cranes are essential about the yard and wharf, the steam crane being the handiest type. Some rolling stock is wanted, and workshops for repairs. The materials for temporary works include timber, or steel constructional work. Pile drivers are generally required. Chains, and ropes also, are a large item.

All sea work is exposed to rough weather during certain seasons of the year. Some localities are more unfavourably situated than others in this respect. Frequently work on the sea front has to be suspended during one-half the year, in some instances during two-thirds of the time.

This often has a determining influence on the choice of methods of construction, and of plant. It will affect the question of the employment of concrete blocks, or of bag work, or of concrete in mass. For the success of the two last, comparatively calm seas are more essential than for the deposition of blocks. The latter cannot be set in rough weather, but the blocks can be prepared during that period, and men thus kept employed all the year round. But bag work and concrete in mass must be deposited immediately after mixing, so that a suspension of work during the bad season is then unavoidable.

The subject is one which is of special interest to contractors, who may have to undertake large works involving the employment chiefly of concrete. Contractors, as a rule, do not possess an intimate knowledge of the machinery which is employed in such works. Even experienced engineers often differ in opinion with regard to the most suitable class of plant to employ on a given contract. Some advocate one class of mixer, crane, or system of operation in preference to others. Methods of working are also dependent on the form in which concrete is used, on the employment of materials other than concrete, or the depth of water in which work has to be done, on the nature of the foundations, and the method of construction adopted. For some classes of work a Titan would be quite unsuitable, for others it is the best possible type of crane to employ, as well as the most economical. Goliaths and derricks are best in some instances and most economical; in other works the reverse would be true. The question of the motions desirable in a given crane has also to be considered, and the motive power to be applied, since each type of hoisting machine is constructed in various forms. The contractor may therefore be pardoned if in the choice of his machinery and plant, which in any case is extensive and costly for harbour work, he is rather bewildered, and wishes that the specialised knowledge of the engineer were added to his own.

The excavating machines may occupy our attention through the remainder of this article, leaving the other matters for discussion in a future paper.

The grab family is a very large one, so that the following remarks bearing on leading characteristics of the types may be helpful when making a choice for different duties.

With regard to the two great groups into which all grabs naturally fall—the single and the double chain types—the choice depends on circumstances. If grabs are required for permanent service, then the double chain is the most satisfactory type. Or, if a grab is to be used where large masses of broken rock form a considerable proportion of the spoil, then also the double chain grab is preferable. But for loose spoil, such as gravel, sand, mud, and moderately stiff clay, a single chain grab is practically as good. If required for occasional service only in any soil a single chain is quite suitable. The reasons for these distinctions are as follows:—

A double chain grab, or dredger, as it is indifferently termed, cannot be worked from a crane of common type, but a special design of crane is necessary for the operation of the two chains, and many jobs that involve dredging will not stand the additional cost of a special crane. Manufacturers who offer single chain grabs therefore always make a strong point of the fact that they can be worked with any crane.

On the other hand, the operation of a grab with a single chain necessarily introduces undesirable mechanism into it, from which the double chain type is free, because the mechanism for opening and closing the buckets is transferred from the crane to the grab. This mechanism in the latter consists substantially of sundry levers or dogs acting in conjunction with a ring suspended from the head of the crane jib, and with a special form of chain barrel on the grab, by which the buckets or tines are opened and closed. In ordinary regular working on average materials no disadvantage results from the adoption of this or other equivalent designs. But delay occurs when operating with lifts of varying heights, because the height of the suspended ring has to be readjusted as often as the height of lift of the grab requires alteration. There is not very much in this objection, however, because work is generally carried on at a constant height for a given job. The same remark applies to making a false grab, *i.e.*, the closing of the buckets without gripping any spoil. A steam crane with a high speed of lift can run the grab up the ring to open the buckets, and lower it again within a minute. The really serious objection to the single chain type occurs in submarine work, when the grab gets hitched among boulders, so that it cannot be lifted without risk of breaking the chain or overturning the crane. Here the double chain grab scores heavily. There is, by the way, one single chain grab with which the writer is familiar that can be opened under water from above without sending a diver down or using gripping hooks—the "Peters"—which has been in successful operation for several years. On the whole the objections to single chain grabs do not carry much weight in practice. Hundreds of them have been made and used on great harbour works, and thousands for other purposes, for grain, coke, and general unloading and loading. But this does not alter the fact that the best all-round grab is one that is worked by a special crane, fitted with two chains, one for hoisting and lowering only, the other for opening and closing the buckets only.

When the question of the mode of operation of grabs has been settled, a much wider range of problems calls for consideration, due to the varying nature of the material to be dredged. Buckets are mostly double, but they may be treble, or even multiple. A few are designed for working within cylinders, but most of them are operated in the open. Some are small, others large in capacity. The character of the buckets is determined by whether the spoil to be dredged is soft or hard, wet and spongy, or stony in character; whether a scooping action alone is wanted, or a very penetrative one. These things govern the design of the buckets and the mass of the grab. For dredging light, open sand and oozy mud a plated bucket, with or without corrugations, is used, and usually without tines or teeth. Such a bucket retains securely the mud, or the loose, watery sand, or gravel, which would pass through buckets fitted with teeth. If some considerable penetrative power is desirable in addition, tines are sometimes riveted on the outside of the buckets, thus affording this power without interfering with the complete closing of the buckets.

For most of the service in harbour work the tined grabs are used. These are subdivided into half and whole tine. The buckets in the first are comprised of about

half-plate, and half-tines, attached to the plates; the teeth of which interlock, so that the closure is still nearly perfect. This type is used for a very extensive range of work—for dredging gravel, coarse and fine, stiff mud, shingle, soft clay, chalk, etc.

The whole-tine grabs have no plated portions whatever in their buckets, but they are formed wholly of stout teeth, bolted or cottered into a massive steel frame of rectangular cross section. The tines are maintained at their proper distance apart outside of this frame by suitable straps. Everything is massive, and as the grab is lowered rapidly it starts work with a slight penetration. The tine spaces remain open, so that they are not suitable for lifting soft mud. Their duty lies in getting up very stiff clay, shingle, rock that has been previously blasted, or boulders of moderate dimensions.

Grabs for cylinder sinking have two or three claws—the clam shell types. A grab of this kind is of such a size that it will move freely, yet with little play, within the concrete cylinders. As it is seldom of large dimensions it is often weighted above. When such a circular weight is added, it fits within the concrete cylinder and acts as a steady during lowering. The type of bucket generally used is plated, with tines.

There is very little cast iron about a grab. The only important parts are the sleeve within which the chain slides, and the barrel. These are often made of cast steel, because the incessant friction of the chain, often charged, too, with sand, soon wears grooves in cast iron. Practically all the rest of the structure is of mild steel, though some parts have the tine frames of wrought iron.

The cost of grabbing is greater than that of working with the ladder dredger, or the sand pump. The action of the first is intermittent, that of the latter is continuous. A grab will not under favourable circumstances lift more than one load in about two minutes. But each has its own special sphere, and the province of the grab cannot be economically invaded by the other machines. The ladder dredger and the sand pump are special machines; the grab is one adapted for general and miscellaneous duties. It will work in confined spaces, among the false work of piers, breakwaters, and quays in progress. The other machines can only be operated in the open. The grab will lift stiff clay, broken rock, and boulder more efficiently than the bucket dredger. The sand pump is only suitable for sand that is loose enough to be drawn up by suction or forced by pressure. The grab therefore is *par excellence* the dredging machine of the harbour maker.

But though the intermittent work of the grab might seem almost inadequate compared with the vast areas and the deep foundations required in big harbour works, its aggregate is very imposing. Thus the "Hone" grabs at Dover have done some splendid work in preparing the chalky soil for the concrete blocks. One of these has a capacity for 135 cubic feet of spoil, and weighs seven tons. On one occasion it brought up a piece of rock weighing about 10 tons. These, however, are not worked from jib cranes, but from the 60-ton goliaths that set the concrete blocks. But big grabs, operated by cranes of from 7 to 10 tons power will easily dredge from 400 to 600 tons of spoil in a ten-hour day.

The subject of machines for mixing and depositing concrete on foundation areas prepared by the grabs will be considered, and concluded in our next.

NOTES.

Modern Churches.

ON this subject the current number of *Architectural Association Notes* contains some brief but excellent comments by Mr. Bidlake, in reference to Mr. Nicholson's paper recently read at the Architectural Association. Mr. Bidlake regrets that Mr. Nicholson did not devote more attention to the subject of the planning of modern churches. His reason for pressing this point he gives as follows:—

"Owing, probably, far more to the inveterate conservatism of the clergy than the want of initiative of the architect, churches continue to be built after the Mediæval-English model, with naves long and narrow, flanked by comparatively wide aisles containing seating, an arrangement inimical to one of the chief conditions of modern church planning, that is, that all shall be able to see and hear the preacher.

But while the clergy clamour for the fulfilment of this condition, and upbraid architects for not complying with it, they will not forego that arrangement which association and tradition have made dear to them. This spirit breathed in the original limitation of style in the recent Liverpool Cathedral Competition. I imagine no architect who was anxious to win a church competition would venture too far from the beaten track."

All this is perfectly true, and what we have called attention to over and over again. The mediæval plan, especially with transepts, is not suited for modern congregational worship. In our opinion the mediæval style does not express modern religious feeling; but that, we admit, is a more debatable point, and one which could not properly be discussed in our pages. Mr. Bidlake suggests that the model for the modern church might be better found in the wide-naved passage-aisle churches in the South of France, or the aisle-less churches of Anjou; or again, in the Lombardo-Byzantine churches "to which Westminster Cathedral has directed attention anew." And if a mediæval spirit is desired in the architecture, there is no doubt that any one of these forms of plan is more practically suited for congregational worship than the typical mediæval plan. Our own opinion is that the most fitting type of plan for a modern church is that represented on a large scale by Wren's first design for St. Paul's, and on a small scale by St. Stephen's, Walbrook; but of course with more Christianised and symbolical type of detail. Wren's detail is Pagan in its origin and associations; but there is no reason why the same type of plan should not be associated with a very different order of detail.

A Lecture on Mars.

MR. WALTER MAUNDER'S lecture on the planet Mars, at the London Institution on Thursday last, was most admirably and systematically arranged and illustrated, showing a number of drawings of the planet from the earliest period of telescopic observation down to the present day. It is noteworthy what differences there are in these drawings by different observers of the same object; certain salient features being traceable through them all, but with the most extraordinary variations of detail. The culminating point of the lecture was the consideration of the so-called "canals" of Mars. "Channels" was what Schiaparelli really meant to call them; but the Italian "Canali" became Englished into "canals," and perhaps thus set up the idea which has taken hold on the public mind, but of which there is at all events no proof. Mr. Maunder adopted the hypothesis, which has been referred to with some doubt in our pages, that these lines on Mars were really the result of a strain on the optic nerve of the observer. Two points however were brought out in the lecture to which prominence has not been given hitherto. One is, that Schiaparelli built up his net-work of lines from separate observations which were almost momentary in some cases; that is, he glimpsed a certain line for a second or two, and inserted it on his diagram, but lost it again almost immediately; then he glimpsed another in the same fashion, which was in like manner added to the diagram. This is very different, of course, from seeing the whole collection simultaneously. We have put the question more than once—if these lines are illusions of the observer, why are they not seen on Venus, for example, which displays as clear a disc, under favourable circumstances, as Mars. It appears, however, that the American observer, Mr. Lowe, who so strongly supported Schiaparelli, did see straight markings on Venus, and we were shown some of his drawings of them. This is strong evidence on the sceptical side, since it is almost certain that all we see of Venus is her outer atmosphere. The illusion is explained by Mr. Maunder as arising from the eye connecting little points or marks which are nearly in a line with each other, by a continuous line of the imagination. We must admit that Mr. Maunder's argument on the sceptical side, as put in his lecture, seemed very complete and convincing. But there is one thing we should have liked to have seen which we did not see—a photograph of the surface of the planet enlarged for the lantern. Stellar photography is surely capable of that now, and we ought not to be put off with drawings which are very liable to error and illusion.

The Board of Trade Report on South African Trade.

THE Report of Mr. Henry Birchenough, the Commissioner sent to South Africa to investigate and report on the conditions of trade in that country, has rightly attracted very great attention. In addition to a general review of the situation from the point of view of English trade, the Commissioner gives a number of details in regard to many special points. He gives information as to the trade in building materials, and in all articles connected with the erection of houses; he also refers to the work which is being done by the various municipal bodies for which the materials have to be imported. There is an immense field in South Africa at this moment for those who supply articles connected with all kinds of building work, and no one interested in it should fail to peruse this report from beginning to end. It can be obtained by any bookseller from the official publishers for the modest sum of one and

sixpence, and will place the reader in possession of information to be relied on, and impossible to obtain from any other source.

Compressed Peat. A further attempt is now being made to popularise the use of peat by a new process for converting this material into a marketable fuel. The product obtained is in the form of slabs, consisting of compressed peat, or, as the patentees term it, "peat-coal." It is stated that the calorific value of the fuel is about 9,000 B.Th.U., which compares favourably with ordinary coal. Further, it is asserted that the new fuel possesses the important advantages of burning without smoke, and of leaving no clinkers, while its regular form facilitates stacking and economises space. The cost of production on a large scale remains to be ascertained by actual experience, but the opinion is expressed that the price will be considerably lower than that charged for coal in many parts of the country. If the peat found in Irish bogs and in various districts in England and Scotland can be utilised a most important industry may be established. In Ireland alone the area of peat tracts is estimated at nearly 3,000,000 acres. Any enterprise calculated to promote the utilisation of these extensive peat fields is certainly deserving of support.

An Invalid By-Law. The case of Nokes and Nokes *v.* Mayor, etc., of Islington, recently reported, is one of some importance to householders. The County Council, under section 39, sub-section 1, of the Public Health (London) Act, 1891, have power to make by-laws in relation to closets, privies, etc., in connexion with buildings, whether constructed before or after the passing of the Act. Acting under this section, they passed a by-law that "the landlord or owner of any lodging house shall provide and maintain in connexion with such house water-closet, earth-closet, or privy accommodation in the proportion of not less than one water-closet, earth-closet, or privy for every 12 persons." The appellants were agents for letting the said house and collected the rents, and had ejected some former tenants, and in January of this year had let the house to one Gates at a rack rent of 36*l*. Gates sublet the rooms, and four separate families, sixteen people in all, occupied the house. The sanitary authority left a notice on the premises, and on the appellants, requesting the abatement of a nuisance, *viz.*, insufficient water-closet accommodation. The Divisional Court have held that the by-law is invalid on the ground that it contains no notice such as that furnished by section 37 of the Public Health (London) Act, 1891, calling upon the person complained against to abate the nuisance. The Court particularly pointed out that the absence of some such provision was calculated to work injustice, especially in cases such as this where the complaint was directed against persons who, although not owners, were to be taken to be in the position of owners. It must be borne in mind that had the by-law been valid, it was decided in the case of Salt *v.* Scott Hall, on which we commented in our issue of August 22 last, that a discretion is still left in the magistrates under the Summary Jurisdiction Acts as to whether they shall enforce it. We only, however, refer to this decision here because its effect cannot be too widely known when it is a question of enforcing by-laws not invalid in themselves, but containing restrictions on buildings unnecessary or undesirable to be enforced in the particular circumstances of any special case, as, for instance, in the case of buildings widely isolated.

Repairs to Water-closets. An interesting case has been decided in the King's Bench Division as to the meaning of certain by-laws of the London County Council. The Metropolitan Industrial Dwellings Company had occasion to substitute certain iron drain-pipes for old stoneware pipes at their industrial dwellings, known as Ponsonby-buildings, which had been erected before the confirmation of the drainage by-laws of 1901. As the old traps and pans of thirty-three water-closets were broken during the progress of the work, new traps and pans were fixed, but no alteration was made in the soil-pipe. The Southwark Borough Council attempted to compel the company to fix anti-siphonage pipes to all these closets in accordance with By-law 17, basing their contention on By-law 21, which is as follows:

"These by-laws shall, so far as practicable, apply to any person who shall construct or reconstruct any pipe or drain or other means of communicating with sewers, or any trap or apparatus connected therewith, so far as he shall effect any such works in any building erected before the confirmation of these by-laws, as if the same were being erected in a building newly erected."

The company refused to comply with the Council's notice, and thirty-three summonses were therefore issued against them. The case was first tried by Mr. Chapman, metropolitan police magistrate, sitting at the Southwark Police Court, and his decision was in favour of the Council. The company appealed, and the magistrate's decision has now been reversed. The Lord Chief Justice in giving judgment brushed aside the appellants' contention that the by-laws were *ultra vires*, and declared that if By-law 17 had in terms said that in the case of old houses, when a broken trap was repaired, a certain system of ventilation must be put in, that might be a perfectly good by-law. He saw no reason why it should not. But he laid it down that the local authority ought to have stated in the by-law, in plain words, what repairs were to be regarded as sufficient to constitute a construction or reconstruction of a water-closet. "By-law 21 did not inform a person that if he repaired a trap or pan he was constructing a water-closet." The appeal was therefore allowed. It must be confessed that this decision opens the door to litigation. It is clear enough as far as it goes, but it does not go very far. It shows that the by-laws do not apply to every repair which may be necessary in a water-closet, and is therefore of considerable importance, but it leaves the question open as to what repairs will bring the by-law into operation.

Electrical Recording Instruments. Professor Hospitalier, the President of the Société Internationale des Electriciens, described and showed in operation to the Institution of Electrical Engineers last week various recording instruments which he has invented. The first of these, which he called an ondograph, recorded on a sheet of paper wrapped on a revolving cylinder, in a few seconds, the exact shape of the wave of the alternating current which was supplying the glow lamps in the lecture hall. As the current goes through all its values in the two-hundredth part of a second, this was a remarkable achievement, and the applause with which it was greeted was well merited. The oscillograph with which electricians are now familiar shows the shape of the wave by means of a spot of light falling on a sheet of ground glass, but it is more a laboratory than a workshop instrument. It seems to us that Professor Hospitalier's ondograph will be of great value in the test rooms of the makers of electric machinery. It has been known for several years that the efficiency of alternating current apparatus, especially of arc lamps and induction motors, varies with the shape of the wave of the alternating current with which they are tested. In one case in our experience a motor which worked excellently when driven by a certain alternator, yet when driven by another worked in a most erratic manner, and could only take a small load. The difference in its behaviour in the two cases was due to the wave form of the supply current. In another case there was a difference in the efficiency of a transformer of 50 per cent. at quarter load when tested on two different supply circuits. With an ondograph this would have been discovered at once, and the efficiency on all other wave shapes could have been foretold from one test. The lecturer also showed his "arcoscope" in operation. By its aid an image of an alternating current arc was thrown on a screen and made, apparently, to go through all its values in about half a minute. In reality it went through all its values in a very small fraction of a second, but the instrument only allows images to be formed at certain definite intervals, and owing to the persistence of visual impressions the eye apparently sees the phenomenon taking place very slowly.

The Communication Cord Again. It is not surprising that the action—or inaction—of the North Staffordshire train officials in connection with the recent assault on a passenger in the Harecastle tunnel has provoked much unfavourable criticism. We have ourselves frequently commented strongly upon the failure of the communication cord itself, but in this case, although the apparatus appears to have worked properly, no immediate notice was taken of it. The excuse made is that as the train was so near a station it did not seem worth while to pull up before reaching it; and it is further alleged that the communication cord is frequently tampered with. The obvious answer to this is that every effort should be made to detect offenders, and when caught they should be severely punished. It is to be noted that the railway company have marked their sense of these excuses by suspending the driver and guard. Our mode of travelling makes it imperative that such safeguards as are provided for travellers should be

thoroughly reliable. The failure of a mechanical appliance is bad enough, but we should be able to place implicit confidence in those responsible for answering to the call of the alarm bell.

Clubs *v.* Private Dwelling Houses.

THE Divisional Court have held in the case of M'Nair *v.* Baker that a club is not "a private dwelling-house" within the exception contained in section 24 (*b*) of the Public Health (London) Act, 1901, and therefore that those responsible are liable under that section if proper steps are not taken to consume the smoke from its chimneys. Reliance seems to have been placed on the fact that there were bedrooms for the use of members on the premises; but quite apart from the fact that there were only five bedrooms and 750 members, it is difficult to see how this could differentiate a club from a hotel, which certainly could not be deemed to be a private dwelling-house, or a school, which for the purposes of a covenant in a lease has been held not to be a private dwelling-house. The legal profession alone seem to have derived much benefit from the decision.

The "Novelty" Locomotive, 1829.

WE learn that this old locomotive has recently been identified as still doing duty in the modified form of a stationary engine at the Rainhill Gas and Water Company's works, near St. Helen's, Lancashire. Braithwaite and Ericson constructed the "Novelty" to compete in the memorable trial that took place on October 6, 1829, preparatory to the opening (on September 15, 1830) of the Liverpool and Manchester Railway; but it broke down, after having run about four or five miles, by reason of a failure of its boiler. George and Robert Stephenson's "Rocket" won the prize of 500*l.* offered by the railway directors, the "Sans Pareil," by Timothy Hackworth, of Darlington, being second. The latter two locomotives have found asylum in the Patent Department of the Victoria and Albert Museum at South Kensington. It is stated that steps will be taken to remove their quondam rival to the same resting-place, where also are preserved M. Hedley's "Puffing Billy," of 1813, which was used until June 6, 1862, at the Wylam Collieries, the original model, in brass, of Trevithick's locomotive of 1802, and a copy of Murdock's locomotive of 1781-4, which is said to be the first after its kind, and is believed to show the earliest adaptation of the slide-valve.

Mr. Collings's Water-colours.

THERE is an exhibition at the Dowdeswell Galleries of water-colour drawings by Mr. C. J. Collings, who had an exhibition of similar work there two or three years ago. Mr. Collings has a true feeling for colour and composition in landscape; his small studies of extended landscape, such as Nos. 11, 17, 25, and 31, are all marked by fine composition and aerial effect, and "Down Channel off Deal" (38) is a remarkable bit of effect, especially as regards the sky. But he has, like some other artists of the new school, taken up that manner of painting only tones and evading texture and detail, which has a very weak effect in scenes in which foreground is more important. Even in one of the landscapes just mentioned—"Near Worth" (17), the foreground meadow is but a wash of colour; apart from its place in the composition, it might be anything; and in subjects where foreground buildings came in, there is no recognisable structural detail or material. In "Yachts Manœuvring for Place" (21) the yachts have practically no hulls, only faint blots without shape or drawing. This is not a thorough or satisfactory way of painting, though it may be admissible for a certain class of subjects.

ACADEMY STUDENTS' DESIGNS.

THIS is not a very good year among the Royal Academy students, except in sculpture. Architecture is certainly not in much force. The subject for the gold medal and travelling studentship in architecture was the important and (we should have thought) inspiring one, "A Domed Church"; but it has not inspired much. Only four competitors have entered for it. Of these, the award of the prize to Mr. L. Upperton Grace was, we admit, the only award that could be given, because it is the only one which has the merit of correctness and completeness of treatment; but it is, nevertheless, a rather commonplace piece of Renaissance design, and gives little evidence of architectural genius. There is more of this quality in the less ambitious design with a low dome on a plain circular drum with small circular lights in it, the mass of the wall rusticated up to the cornice; the interior of this would be susceptible of fine effect; but the problem is much easier than in the prize design, and there is a want of perception of scale about it. The other two designs are more ambitious than successful.

The silver medal for architectural drawing is given to Mr. Leslie Wilkinson for measured drawings of the interior of St. James's Church, Piccadilly, which are quite satisfactory; the other competitors for this medal have done their work conscientiously, and Mr. J. de C. Ballardie gets a second medal for his drawings.

The prize for "Plan of a Building" is not awarded; the prize in perspective drawing for painters and sculptors has attracted no competitors, which has been the case we think before; it is to be regretted, for though sculptors need not trouble so much about perspective, as they work in the round, painters are very much in need of it, as their works do often demonstrate. The prize for perspective drawing for architects only is not awarded.

The 25*l.* prize for "a set of architectural designs" is awarded to Mr. W. E. Brooks for a good set of drawings for a morning chapel to a cathedral, in orthodox and not very strong Gothic, but carefully considered and drawn. Among the others, No. 109, front and plan of "A Branch Insurance Office," is very creditable; so is the elevation (171) for "A Secondary Technical School"; the plan is rather naïve, but the aspects of the rooms are right and a north point is shown. There is also merit in the domed drinking fountain (172). The 10*l.* prize for "Set of Drawings of an Architectural Design" (lower school) is awarded to Mr. Geo. Forsyth for a design for "A Village Church," of a simple Gothic and very pleasing and suitable in character—what a village church ought to be; the others have missed this character, showing designs that are too restless and pretentious, except No. 175, whose design for a church "on the side of a hill" has simplicity and reserve of character, but the details are not very satisfactory. The work of the travelling student in architecture for 1901 does not make a very large or elaborate show, though it contains some good and interesting work, such as the elevation of the Piccolomini Palace, at Siena, and the full-size details from a house-front in the same city.

On the whole one cannot help concluding that an architectural student from the Ecole des Beaux-Arts would think rather small things of the productions of our Academy School in Architecture.

It is otherwise when we turn to the sculpture. Whether among the established artists or the students, sculpture, which not so many years ago was at so low an ebb in this country, seems now to be the art which is in the most vital condition. The subject for the gold medal this year was "Three Generations," a good subject, implying a group of three persons representing old age, the prime of life, and childhood. The general wording of the subject left something to the imagination of the competitors, leaving them free to represent it in any way they pleased. There has been a good competition, and the average of merit is high. Mr. Arthur C. White, in the group to which the medal has been awarded, apparently intends to represent the nude figure of the mother as dead, lying across the knees of her aged father who holds her infant child in one arm. The *motif* is pathetic, and the three figures are composed into one group in a very satisfactory manner from a sculptural point of view. Among the other works No. 135, in which age is represented by an old woman, is very good; there is a spirited effect in No. 136, showing the man on horseback with his father and his young son beside him; and No. 140 is a very pretty group. But to our thinking the most remarkable production, even more so than the prize one, was No. 138, which showed both decorative feeling and poetic conception. A tall, mystical figure of antique Egyptian cast holds in each arm an infant, the two appearing to symbolise Past and Future; she stands on a pedestal planned into four niches, three of them containing each a group of man and woman, lovers; the fourth, at the back, contains a winged nude female figure alone. The symbolism of the whole is rather vague, though we do not like it any the less for that—a vague symbolism in sculpture leaves the spectator all the more fancy-free. The treatment is not exactly that which was probably intended in giving the subject; apart from that we should have thought this design deserved the prize; at all events, it was the most original and the most decorative in effect of the works submitted, and we should expect to hear more of its author. The smaller competition, "Model of a Design," the subject being "David Cutting Off Goliath's Head," attracted a great many competitors. The subject as worded is a bad one, the literal rendering of which would have been somewhat butcherly; most of the competitors have avoided this by representing David making a more or less theatrical sweep of his sword preparatory to the operation. Mr. Leonard Jennings's prize group, a nude David modelled with much spirit, is the best and merited the 30*l.* prize; many of the others are clever.

Historical painting is seldom one of the chief successes of the competition, and this year the prize has been withheld, and no wonder; the subject was "The Meeting of Alexander and Diogenes at Corinth," and of the various conceptions of the conqueror it would be difficult which was the weakest. The Armitage prize for "Design in Monochrome for a Figure Picture" ("Elijah Cursing Ahab and Jezebel in the Vineyard") is also withheld, nor again can we be surprised; the essential point of this sketch competition lies in the conception of the subject, and this was of the weakest in most cases; No. 23 was a better composition than most, and No. 28 spirited in the action depicted. The rest were on the level of ordinary "Bible pictures." The draped figure prize has only attracted four competitors, a smaller number than usual, and we have seen much better works than this year; the designs are weak in line and rather theatrical in manner. The competition for "A Design for the Decoration of a Public Building" has been gained this year by a lady, Miss Lilian Price-Edwards, whose design was the only one showing a true perception of decorative composition in a picture of this type; she illustrated "Charity" (the subject given) by a central seated figure of a nun or sister of charity (rather a limited idea in an intellectual sense) whose ample dark robe falls in broad masses to right and left and seems to bind together the whole composition; a nude figure of a young girl in the group in front of her forms an effective contrast. The want of a grasp of the composition as a decorative whole is the defect in the design of Mr. W. E. Webster, who gained a *proxime accessit* for a picture in which the figures are good in themselves but the composition too scattered and broken up. Among the other designs No. 178 showed, on the other hand, a good composition, but the figures are rather too sketchy and undefined when considered singly.

The Creswick prize, "A Bank of Ferns and Bracken," was well won by Mr. W. Percy Day for a really good picture, notably for the feeling for colour displayed in it, and the absence of those crude greens which are generally too prominent in this competition;

his treatment of the subject did not, however, keep so close to the wording as some others. The intention of the subject obviously was to promote foreground study; Mr. Day's picture showed a scene in a wood, with a foreground of the kind indicated, but the picture did not depend on that. However, it was undoubtedly the best and most mature in style of the works submitted. Among the others there was merit in No. 23, which also kept closer to the subject; 32 was a good one, but rather too scattered and broken-up in line; 30 better in composition, but not good in colour.

The award of the Turner gold medal seems rather a mistake in one sense. The subject given was "An Express Train at Sunset" (the Council were no doubt thinking of "Rain, Steam, and Speed"), but the very name of "Turner medal" seems to imply, and is usually taken to imply, a competition in landscape painting. The medal has been awarded to what is essentially a figure picture by Mr. J. H. Lobley, who shows a train crossing a road on an elevated viaduct, with groups of persons collected on the street, and a red sun showing in the rear. It is the cleverest picture submitted, and it cannot be said that it does not represent "an express train at sunset," but it seems snatching the prize on a side issue. All the other competitors have treated the matter as one of landscape, with a train, and sometimes a viaduct, introduced. Among them No. 15, on the Derbyshire Midland railway track, had a good deal of merit; No. 16 was better in tone and lighting, though rather too like a large sketch; No. 12, showing a river and a stone viaduct, deserves mention. In one point the competitors all followed the example of Turner; they had taken no more pains to indicate the true proportions and structure of a locomotive than he would have done, or did, in a similar case.

FREE LIBRARY COMPETITION, TAMWORTH.

ALTHOUGH situated in a mining district, Tamworth is to be considered an agricultural town. To the architect, it possesses much that is interesting in its fine parish church, half-timbered houses, Georgian brick buildings, and some nineteenth century work of no mean order. Factories have recently been springing up, and modern progress is everywhere visible, so that the proposal to build a free public library is quite in the order of events.

Mr. Andrew Carnegie has generously given the sum of 2,000*l.* towards the building under the usual conditions which are attached to his widespread benefactions. The Corporation decided to set aside 400*l.* for architects' fees, clerk of works' salary, costs of the competition, and incidental expenses, leaving the sum of 1,600*l.* for the new building, which is to provide for the intellectual needs of the 7,500 inhabitants of the Borough. In response to a small advertisement in our columns over 300 applications were made for the instructions, 267 copies of which were sent out (over 50 applicants being too late), and 148 architects submitted 163 schemes! The premiums offered were 20*l.*, 10*l.*, and 5*l.*, but it should be mentioned that these amounts were *not* to merge into the fees of the selected architect.

It is remarkable that such a small work for so little remuneration should have attracted this large entry; it points to the fact, however, of a free library being a favourite subject, and to the dearth of building works at the present time. Looking broadly at the drawings submitted, one-third, at least, of the designs is the handiwork of beginners, and might have been excluded by the introduction of an entrance fee. Much of the design is excellent, well suited to the purpose in view, and the standard of draughtsmanship is of a high average. It will be readily seen that the strict limit in accommodation and outlay has produced a great similarity in design; the conditions enabled competitors to place windows on all four sides of the site, the frontage of which is 65 ft. and the depth 120 ft. On the north is a disused cemetery, on the west is Corporation-street, whilst a vacant plot of ground belonging to the Borough abuts upon the east and south boundaries.

Mr. J. A. Cossins, of Birmingham, was the assessor, who has awarded the first premium to Mr. E. R. Danford (Northampton), the second to Messrs. Buckland and Haywood-Farmer (Birmingham), and the third place to Messrs. Hodge and Haswell (Teddington).

We find ourselves, after a survey of the drawings, at variance with the assessor in this selection. While admitting that, out of such a large number of schemes, he has taken three which, so far as expense and convenience of plan are concerned, fulfil most of the requirements, we should seriously have considered other claims to the premiated positions.

The design placed first is a compact working plan, with the large reading-room on the south side, which we do not think the best aspect, and, moreover, in this case, it is liable to lose its light in the future development of the vacant site; this room is used more than any other in this kind of institution. Sanitary conveniences are prominently arranged on either side of the main entrance, which is placed in the centre of the street front. There is a hall, lighted from a skylight, used in common by all sections of readers. The difficulty in almost all the schemes has been the question of roofing. Most of the competitions show a central top light with lead flat enclosed by pitched roofs, such as a much larger building would necessarily require, but in the case of this small library it should have been dispensed with. Mr. Danford's section shows a gutter between two roofs, from which it would be very difficult to remove an ordinary depth of snow. His librarian has a small room, with north and east aspects and no lavatory accommodation or external entrance lobby; it is covered by a flat, which makes a most unsatisfactory elevation to the north, and is the weak spot in the design, for this front will be seen perpetually and never be hidden by other buildings, such as are liable to occur on the south side. The maintenance as well as first cost will be heavy on this structure owing to the many dormer windows on the side elevations (not indicated too thoroughly), and to other details. The elevations do not excite much commendation and are the least atractive of the author's numerous schemes and alternatives.

Messrs. Buckland and Haywood-Farmer's design, placed second, should receive the premier position in our opinion for, in addition to avoiding the objections taken to the first scheme, a building has been designed which has considerable architectural merit, both to the fronts and to the interiors. The outlay arising from maintenance would, moreover, be smaller owing to a simpler roof scheme. A central entrance is again introduced, and the sanitary conveniences made less conspicuous. The large reading-room is placed on the north front. Although the cubical contents of this design appeared to us to be practically the same as that placed first, the respective competitors' statements differ considerably. However, we repeat that this well-thought out scheme, merits the first premium.

The design placed third has a plan in several respects similar to that just described, but loses in the librarian's accommodation amongst other minor points), where no fireplace is provided and an inconvenient entrance lobby is indicated. The elevations show a poor rendering of brick and stone material, which is not enhanced by the sloping buttresses and other meaningless features.

Of the other designs submitted, the following deserve reference; the authors' names were not disclosed.

No. 38 has a simple, good working plan, the line of which follows the north boundary; the refernce room has a central position where few noises will penetrate, and faces north; the large reading room is entered without disturbance to the other departments—a point missing in all three premiated plans. The elevations are simple and straightforward, and the drawings are excellent. No. 25 has a set of charming elevations with a fairly good plan. No. 103 places the reference room in the rear of the site to secure seclusion, but the plan is too cut up, and the fronts leave room for improvement. No. 66 is one of several schemes whose authors considered two floors advisable, but it should be remembered that only one librarian is to be installed, who could not possibly exercise supervision of upstairs readers. In all general respects No. 81 has a good arrangement, but 8ft. 6in. to the springing and 13 ft. to the crown of the coved ceilings is insufficient. An ingenious point, and, indeed, the basis of design No. 112, is the placing of the librarian direct in the centre of the various public rooms—in a kind of cage into which external air is admitted from windows, the sills of which are 12 ft. from the floor line; a fireplace is provided for his comfort. No. 154 has misjudged the proportion of the reference room and, accordingly, provides one too large; like No. 153, whose central hall is wasteful, the cost of carrying out would be too great. Another wasteful scheme is No. 84, wherein the lenders' counter is badly placed and top-lighted from the same source as the hall, but the sections do not show how this is obtained. Urinals are provided for men. The scale of the elevations in No. 57 conveys the impression of a large public building; the same may be said of the plan. No. 44 has a clever plan with a long central passage. The elevations are heavy, but with all the parapets and lead gutters, maintenance would be a source of constant expense. The external design of No. 88, which exhibits a correct feeling for a brick and stone treatment, is worthy of a better plan; here the lending and reading rooms are entered direct from the street, and lavatories for men and women open out of the reference room! After a good struggle, No. 105 has succeeded in placing the librarian in a small recess right at the back of his building, from which he can see to every part of the library, at great inconvenience to other requirements; the elevations are beyond our powers of description. At least half-a-dozen competitors have schemed patent revolving doors to the main entrances; one of these is No. 35, whose plan is practical, but the cornice surmounting the fronts is, in scale, worthy of a Florentine palace. No. 36 is another to introduce this patent, and whose plan has a central passage extending to the full length of the building; the reading room is split up into male and female departments separated by lavatories, the approaches to which are well considered. No. 134 has the main entrance on the north side and an independent door to the news' room; the form of buildings is of a narrow character which obviates top-lighting, flats, and skylights; this is an admirable design. A most pleasing design is that marked No. 128 and is well drawn; the reference room lacks supervision. No. 98 is also a delightful design, but the plan leaves much to be desired. Several competitors have sent three or more schemes. No. 7 sends two designs completely worked out, supervision is not considered. Other competitors are fantastic. Of these, No. 51 has an ambitious lay out of the rear part of the site, in which a fountain and garden shed are prominent.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE ordinary fortnightly meeting of the Royal Institute of British Architects was held on Monday at No. 9, Conduit-street, W., under the chairmanship of the President (Mr. Aston Webb, R.A.).

Deceased Members.

The Secretary announced the decease of the following members:—Mr. Charles Fowler, Fellow; Mr. N. Y. Armstrong Wales, Fellow, elected 1901; and Mr. Wm. Warlow Gwyther, elected Fellow 1880.

The President said Mr. Charles Fowler would be known and beloved by a great many of those present that night. He was elected an Associate in 1851 and a Fellow in 1862. His father was one of the founders, and for some time Hon. Secretary, of the Institute. Mr. Fowler held for many years the appointment of Surveyor to the Portland Estate, from which he retired three or four years ago. The deceased gentleman was an active worker for the Institute, having served on the Council and acted as Chairman of the Board of Examiners, and all who knew him personally loved him. Now Mr. Fowler had gone to his rest, and perhaps he might be allowed to propose that a vote of condolence be sent to his widow and family.

The vote was agreed to in silence.

Royal Victoria Hospital, Belfast.

Messrs. W. Henman and Henry Lea, C.E., then read papers on the initiation, design, and equipment of the Royal Victoria Hospital, Belfast, of which the following are abstracts:—

Mr. Henman said there was much that was unique in its inception, original in its design, and novel in its equipment, which had attracted attention to the Royal Victoria Hospital, Belfast. It seemed, therefore, advisable that an authentic description should be published of the reasons which had led to what had been termed a "revolution in hospital design," as well as of the methods and means by which it had been accomplished. If the plan was revolutionary in its tendency he hoped to show that it was a serious endeavour to simplify, and, if possible, to improve hospital design. Whether it was destined to secure permanent approval, or be pointed at as an example to be avoided, depended upon, first,

whether the essentials in hospital design had been properly appreciated and applied; secondly, whether those having the care and management of the institution would maintain it in efficiency. As regards the development of the design in question, distinct variations in hospital planning had been principally brought about as knowledge increased of the necessity for efficient ventilation and of the means by which it could be secured. Hence, with mechanical means at their disposal, an attempt was made at Belfast to design a hospital that could be efficiently ventilated by such means. The author acknowledged his indebtedness to Mr. William Key, of Glasgow, who had proved the possibility of securing efficient ventilation on the plenum system—the system which had been adopted at the hospital. The wards of a hospital are occupied both day and night by patients in a low state of health, and continuous change of air, with an equable temperature and freedom from draughts, secured without noise or dirt, is necessary to the cure of the patients. The question therefore is, How can hospital wards be designed and arranged so as economically and effectively to secure the desired conditions? Reference was made to correspondence which had appeared in the *Builder* suggesting that in consequence of the proved success of plenum ventilation, combined with antiseptic treatment, it might be possible to dispense with the "pavilion" arrangement of wards, and advocating double wards divided longitudinally by dwarf partitions. This idea had seemed to the author altogether wrong, and he had set forth his views in a letter in the *Builder* of August 8, 1896. Here he suggested that, "instead of erecting detached pavilions of several stories, it might be better to spread out the wards on one story only, placed side by side and lighted by continuous lantern lights. Such an arrangement would secure greater comfort to the patients, simplify ventilation by mechanical means, and very considerably reduce corridor communication as well as dispense with the inconvenience of staircases and lifts, thereby facilitating administration. For the accommodation of the staff there would be no objection to buildings of several stories, but with all the patients compactly arranged on one floor level their wants could be easily supplied, and other difficulties of the pavilion plan would be overcome." The letter concluded: "Only those who study what is possible with the plenum system of ventilation properly applied can realise the practicability of such an arrangement; yet by its employment I feel convinced that some such revolution in hospital planning will be accomplished, and do not doubt that in time it will be demanded, partly in consequence of the great cost of the pavilion plan, but more particularly in consequence of the excessive labour thereby involved."

When the author was requested to meet the Committee of the Royal Victoria Hospital, Belfast, reference was made to the suggestions contained in the above letter, and he was questioned as to the practicability of constructing a hospital such as he had proposed. On attempting to fit together, on entirely new lines, the intricate requirements of a complete hospital for 300 patients and a large staff, he began to realise the difficulties he had imposed upon himself. With the assistance of his partner, Mr. Thomas Cooper, the plan in time, however, assumed the generally symmetrical arrangement in which it now appeared in the erected building.

The author referred to the opposition raised against the scheme before it was finally sanctioned by the Committee. Professor Byers, Member of Council of the British Medical Association, and honorary member of the medical staff, averred that, "when first he heard that it was proposed to place all the wards side by side without intervening open spaces, to light them principally from above, and to have no windows to open, it appeared to him so contrary to all his preconceived ideas on hospital design that he determined to oppose the carrying out of such a plan by every legitimate means, and, to enable him to do so effectually, he set about independently to study the subject in all its bearings; but, to his surprise, the more thoroughly he probed it the more and more convinced he became that Mr. Henman was right."*

* Asked recently for his personal experience of the working of the Hospital, Prof. Byers said that the building "more than fulfilled his expectations, the plenum system worked admirably; and whether from the point of view of administration, ease, and comfort of patients, or adaptability to clinical teaching, he knew no hospital equal it."

The cost of the buildings, including all engineering requirements and a complete steam laundry, was but a trifle over 300*l.* per patients' bed—proof that the arrangement of plan is capable of being carried out at an economical figure. The site is six acres in extent, to which another six is to be added. The hospital stands comparatively high, has a pleasant outlook in every direction, and is readily accessible from most of the large manufactories and works, and from the poorer parts of the city, whence the majority of the patients will come. From west to east there is a fall in the level of the ground of over 20 ft., of which advantage has been taken; by keeping the main floor level well above the ground adequate height is secured for the principal fresh air-duct, which runs under the main corridor, for the branch ducts conveying fresh air to the several wards and accessory rooms, also for a pipe-duct running parellel with the principal air-duct—a necessary provision, so that heat from the steam and hot-water pipes may not penetrate the buildings during the summer months, and that convenient access may be obtained to all piping.

Opening directly from the hall opposite the porch entrance runs the main corridor from east to west, some 450 ft. long and 9 ft. wide. Branching southward are seventeen short corridors, giving access to as many wards, each with fourteen beds, with their accessory rooms, all practically under one roof. The eight wards to the east are for medical cases; then come eight wards for surgical cases, and one for gynæcological cases. To the north are two for ophthalmic cases.

The author described the general arrangement of the rooms—male and female wards, class-rooms, clinical-rooms, operating-rooms, ward kitchens, store-rooms for clothing, nurses' and cleaners' rooms, sanitary conveniences, etc.; also the "Extern," or out-patients' department, with its waiting-hall and medical, surgical, and specialists' consulting-rooms, examination-rooms, dispensary, etc. Intercepting lobbies between wards and conveniences are dispensed with. Open windows with plenum ventilation are objectionable, and without open windows intercepting lobbies are an anomaly. By simple adjustment, air from sanitary turrets is prevented from entering the wards, air pressure in their direction being maintained from the wards outwards. To the ward-kitchens no doors are provided. With plenum ventilation an equable temperature and freedom from draught are secured, consequently inner doors are required only for the sake of privacy, or where difference of temperature is desired to be maintained.

Two small detached buildings at the west end of the site are for isolation purposes. They receive fresh air by a continuation of the main duct underground, and, although at least 600 ft. away from the fans, are amply supplied with fresh air.

The author showed sections through a portion of the ward-block to give a general idea of the method of lighting and of the construction adopted. The windows are not skylights, as generally understood, but may be more properly defined as clearstory windows, slightly sloping, and glazed with half-inch plate glass. The result is most perfect lighting to every portion of the building. Surgeons using the operating-rooms state that nothing could be better for their purpose; the light is ample, well-diffused, and free from shadowing. An advantage of plenum ventilation is that the cubical contents of buildings may be very considerably reduced. Given sufficient floor area for nursing and teaching purposes, the height of wards need be no more than appearance demands, and when lighted, as they are in this instance, the cubical contents are much reduced, being not more than two-thirds of what is ordinarily required.

After referring to the administrative buildings, the author described the various fittings and appointments of water-closets, sinks bathrooms, operating-rooms, post-mortem rooms, pathological and microscope rooms. The whole of the sanitary appliances were carried out from the architects' designs by Messrs. Morrison and Ingram, and fixed by Mr. John Dowling, plumber, of Belfast.

Mr. Henman concluded with a word of caution about plenum ventilation. It is essential it should be applied with full knowledge and by those competent to deal effectively with it. Distrust an engineer who will give a scheme for ventilating any building indiscriminately on the "plenum" or "extraction" system, or by what are termed natural means; but try to realise that every building should be designed for the particular method of ventilation intended to be employed, and that the means for procuring ventilation must be specially designed on scientific principles to meet the actual requirements of the building.

Mr. Henry Lea, M.Inst. C.E., who followed with a paper on the "Engineering Work of the Belfast Hospital," speaking of the ventilation, said that the design which Mr. Henman had originated facilitated to an extraordinary degree a simple arrangement of air-ducts of ample proportions. To emphasise the importance of this point, he mentioned two large buildings now ventilated by mechanical means, each having about 13 million cubic feet of fresh air driven through them per hour. In one building, owing to the liberality with which the air-ducts are proportioned, the total amount of power required to drive the fans was 19 i.h.p.; in the other building, owing to the air-ducts being restricted and very crooked, the power required was 53 i.h.p. Putting this into money value, in one case the driving-power cost 766*l.* per annum and in the other 2,164*l.* per annum.

The main air-duct at the end nearest to the fan chambers has a height of 20 ft. and a width of 9 ft. The full width is preserved to the far end of the wards block, a distance of 443 ft., but the bottom slopes upwards, so that the height is diminished to 6 ft. at the far end. The total cubical capacity of the hospital buildings ventilated on the Plenum system is 703,000 cubic feet. With seven changes of atmosphere per hour in the winter the velocity of the air entering the main duct is 7.06 ft. per second, and with ten changes per hour in the summer the velocity is 10.85 ft. per second. The proportions of the branch ducts and of the vertical air-flues are based upon similar liberal lines, as are also the air-ways through the fan chambers and the water screens. This accounts for the reduction of power for working the system.

Another point in relation to economical working is that the fans are driven by a steam engine, the exhaust steam from which is utilised for heating the water for the baths and lavatories. The lecturer showed that there was a saving under this head of 275*l.* per annum.

The main engineering features in connexion with the ventilation of the hospital having been fully detailed, the lecturer treated of the arrangements for hot and cold water supply. The supply of cold water is brought from the cold-water cistern in the roof of the east wing, and is connected to the return-pipe, so that the cold water, after passing through the rotary pump, enters and is heated by the two steam calorifiers before it passes to the various portions of the building.

The general arrangement of the hot-water circulation includes two hot-water cylinders, each containing 900 gallons of water. To the system of circulation are connected eight subsidiary circulations under the ward block, for the purpose of supplying the baths and lavatories in that block. Other subsidiary circulations are also provided for the ophthalmic block, the extern, and the administrative block. All the hot-water mains and the branch circulations are covered with non-conducting composition. The effect of the rotary pump is such that the hot water is caused to circulate through the whole system about once every fifteen minutes, which ensures evenness of temperature.

The system of cold-water pipes follows substantially the course of the hot-water pipes, with the exception that no circulation arrangements are provided. Wherever the cold-water mains and pipes are exposed to cold air they are covered with non-conducting composition to protect them from frost.

In each of the operating-rooms is an apparatus for sterilising water for surgical purposes. The water for these purposes is first warmed by means of a steam coil, and is then passed through a Berkefeld filter, which frees it from every kind of microbe, and is thereby rendered innocuous for surgical use. The temperature is regulated with the greatest facility.

The laundry is designed so that the articles to be cleansed go through the consecutive stages of treatment without being carried over the same ground twice. The ordinary type of machinery is employed. The exhaust steam from the laundry engine is used to heat the drying closet and water for the washhouse. A fan draws air from the ironing-room, forces it through the heating coils of the drying closet, and thence into the washhouse, upon the

steamy atmosphere of which it has a beneficial effect.

Electricity for lighting is supplied from the town mains. The system of wiring is that which is now well known and generally used, but which the author believes he was the first to use, namely, placing a suitable number of fuse-boxes about the building; using the same sized sub-mains throughout for supplying the fuse-boxes; using the same sized fuses in all the fuse-boxes; placing not more than five 60-watt lamps on each fuse for 100 volts, or eight lamps on each fuse for 220 volts; and using the same sized lamp leads throughout the whole building. The total number of 16 c.p. lamps, or the equivalent, installed in the establishment, is about 1,100.

Sir J. Holder (Chairman of the Birmingham General Hospital) in moving a vote of thanks to the readers of the papers, observed what a great privilege it was to him to have heard the interesting and instructive description of this unique and modern hospital at Belfast. He was the Chairman of the large hospital at Birmingham which had been designed and built by Mr. Henman. When they decided to build that hospital they had a limited competition, and they had as their assessor a gentleman whose portrait they saw in that building—he meant Mr. Waterhouse, than whom a more charming man he had never met. The competition took place, and they gave Mr. Henman the work, and had every reason to be proud of the work he had accomplished in connexion with the General Hospital. When the building was designed, it was designed for a system of natural ventilation, but after the plans were accepted, a friend of his asked him to see a hospital ventilated on the plenum system. He was very much against the plenum system at that time, and took no notice. Then he got another strong letter from his friend, and the result was that he went and saw the system in operation, and he must say that he became a convert to it. After he came back he called a meeting of the Committee, and four of their surgeons and physicians and a layman went to see the hospital, and they were more pleased with it than he was. What convinced him more than ever was that on the second visit it was a dull, murky, wet day in November, and after going over the hospital Mr. Keith took them to see some schools. They went into a board school with about 1,600 children, who were children drawn from a very poor neighbourhood. He was intensely struck with the sweetness of the atmosphere of the schools, for there was no smell of dirty clothes, although the children had then been in the school two or three hours. He spoke to one of the schoolmistresses, and asked her if she suffered from teachers' headache. She said she used to at her old school, but not in that one. He also spoke to the master, and asked him what he thought of the plenum system, and he replied: "I have only one fault to find with it; between eleven and twelve o'clock I get so hungry that I want to have my lunch." When they came back they decided to adopt this plenum system for the Birmingham General Hospital, although they were much enchanted with the natural system which Mr. Henman had provided. However, they decided to alter it to Mr. Keith's system, and they were very pleased now with that system of ventilation. In the coldest day in winter he had been round the hospital, and the lowest temperature he found was 59 deg.; whereas there was 14 deg. of frost outside. He had gone to the hospital in the hottest day in summer, with a temperature outside of 84 deg. in the shade, and he found that the highest temperature in the hospital was 68 or 69 deg. There was a constant supply of fresh air to the patients, and the nurses breathed fresh air the whole time. Another great consideration was that they got no contamination from diseases there. If they got a case of measles in the wards, or a case of scarlet fever, it was very rarely that they had to close a ward. One patient was not breathing the emanations of another patient, for the air went straight away. They were very proud indeed of their hospital. Some time after their hospital was built he went to America. Before they built their hospital, the Johns Hopkins Hospital, of Boston, was put before them as the great model which they should follow. Well, he had an introduction to the architect of that hospital, who told him that they had improved very much on that building since it was erected. He went over the hospital, and it was certainly a fine institution, but it did not compare with the Birmingham Hospital. He also went over the new hospital of the McGill University, Montreal. They were very proud of their hospital at Montreal, but when he told the authorities who he was, they told him that their chairman had been over the Birmingham General Hospital and was not half so satisfied with his own since. He (the speaker) had also visited the Presbyterian Hospital at New York, and after going over it was all the more satisfied with the Birmingham Hospital. Great praise was due to Mr. Henman, and they were very glad that they had him as their architect. One feature particularly was to be noticed, which was that there was not a single block or door altered from the time the design was obtained till the present time. Sir Wm. McCormack, the great surgeon, came down to Birmingham and went over the hospital, and afterwards attended a meeting of the medical faculty, and he said: "I have been over hospitals in Europe and almost every place, and I must say I have never seen a finer and better equipped hospital than you have at Birmingham."

A member asked if the Birmingham Hospital was on the pavilion plan.

Sir J. Holden said it was, and they had Mr. Keith's system of ventilation perfected by Mr. Henman. He was glad, however, to hear that Mr. Lea had gone in for a better system of heating and ventilation than they had. They had four stations for the intake of air and two fans in each case, and these fans were driven by electricity. They had the electricity at low cost, but the cost was 600*l.* a year for driving the fans. It looked as if they had improved upon that, because by Mr. Henman's unique and novel arrangement he was able to condense the building, which certainly would minimise the cost of upkeep. He had not had the pleasure of seeing the Victoria Hospital at Belfast yet, but he hoped to do so, for from what he saw of the plans it was an admirable structure. It was a bold idea of Mr. Henman's to take the hospital in hand like that and put the wards together.

Dr. Childs said he was afraid he would have to strike a discordant note. He would have liked to have heard a little more from Mr. Henman about the question of inlets and outlets. He did not pretend to be an expert at all, but he had given what time he could to the study of plenum ventilation, and was strongly convinced that it was the best method we have for the ventilation of crowded buildings of any kind. But from what he had seen of plenum systems he had come across a great many defects with regard to position and the relative size and shape of inlets and outlets, and he had not had the opportunity himself of finding that any principle could be laid down with regard to these details. They were certainly most important, because in the ventilation of rooms they had not merely to supply a sufficient quantity of proper air, but they must distribute that air in such a way that each part of the room or building should have its proper share of unpolluted atmosphere. Those who had had opportunities of studying the various systems of plenum ventilation, in schools especially, would find that there is frequently a distinct want of method, and that there were many defects by which the air was frequently short-circuited in some cases or distributed in certain parts, leaving other parts quite stagnant. He hoped that Mr. Henman, from his large experience, and especially from the experience he would have acquired from this new hospital, which they all admired so much, would be able to give them some hints as to these details. He was most impressed with the importance of the question, as he had studied it as an amateur. It was, however, as a physician that he threw in his discordant note. They all recognised the necessity of having a sufficient quantity of pure air, and it was the custom to gauge the purity of the air by certain phenomena—the amount of carbon dioxide, the amount of organic matter, and, in addition, the proportion of microbes in the atmosphere. They all knew that if air in a building was being breathed by human beings which had too much carbon dioxide or organic matter, that air was not to their benefit. This they could gauge by means of the chemist's balance, and they could gauge also the number of microbes by bacteriological methods; but there was one product of air they knew very little about, and that was what was generally described as fresh air. He was greatly impressed with the great benefit of the plenum system in crowded buildings or rooms of any kind, as, for instance, such a room as they were in that night; but when they came to hospitals they had a large floor area, and the question, to his mind, was whether the plenum system, from a health point of view, really succeeded. Did the air contain that invigorating freshness which they recognised was possessed by fresh air? To his mind, this was the one thing wanting in the air provided in hospitals by the plenum system. It was not a matter of imagination when they said they felt the benefit derived from fresh air. They opened a window in a close room to get the fresh air from outside, and it was not merely from imagination that they derived benefit. They saw it illustrated in the effects of exercise. Most of them probably knew the invigorating effect of a swift ride on a bicycle or a motor; or, again, if one was in a valley, one felt a want of energy, and that energy seemed supplied the moment they surmounted the brow of the hill. What was the difference? He did not think this had been sufficiently studied in considering the facts of the plenum ventilation. It was due to the movement of the air over the body. He would point out that in a good system of natural ventilation they asked for 3,000 cubic feet per individual when they were within four walls. They were very lucky if they got it, but in the open air on a moderately calm day they had not 3,000, but 300,000, cubic feet of air passing over the body, and there was some effect which they had not gauged due to that air. That this was not fanciful was shown by the wonderful effects produced by the open-air treatment in the case of phthisis. There could be no doubt about that.

Mr. Henman, interposing, asked if they were not going beyond the scope of the paper. He thought they were not discussing the question of the plenum *versus* natural ventilation, but the particular system in a hospital. Dr. Childs evidently did not know anything about the matter.

The President: Excuse me, we are very pleased to hear Dr. Childs.

Dr. Childs said he merely wished to say that before they accepted the plenum ventilation as the best method of hospital ventilation, they should take the things he had mentioned into consideration. It was true that the plenum system did away with draughts and produced a uniform temperature, but they had to ask whether that was the best for the patient. Any one who had tried the fresh air treatment in a general way, as opposed to the closed window treatment, would say how much freer they were from colds than previously.

Mr. Saxon Snell said that extreme importance attached to the subject. It was extremely important for this reason, that the advocates of the plenum ventilation were introducing to the public generally and to architects a system which had a great attraction as something novel and something complicated, and those who considered that the plenum system was a huge mistake felt that they should do their best to have it argued out. He ventured to suggest that under the circumstances, at that late hour, the debate might be adjourned to a future occasion, when he was sure others would like to discuss it further.

Dr. Childs wished it to be understood that he advocated the plenum system for schools, rooms, churches, theatres, and so on. All he questioned was whether it was best for hospitals.

Mr. H. T. Hare seconded the vote of thanks, and supported the suggestion of an adjourned meeting, as he thought a discussion would prove very instructive.

The President said they had all been extremely interested in the papers on a subject of great interest to architects and all engaged in the erection of buildings of a large and public character. He took it that this plenum system must be confined to buildings of a somewhat large character. If they could possibly arrange for another meeting they would do so, but it was always a little difficult to get the same audience together and take up the threads of a discourse where they left it. He felt, like other architects, very much interested in the system, and he must say that he had been extremely interested in this most novel and bold effort of Mr. Henman to meet the difficulties which a long, extended hospital had undoubtedly presented to many people. They all knew of hospitals which were extended to such an extent that the supervision of them became impossible, or almost impossible, and the idea of bringing it all together on one floor and under the easy control of the staff, must be an enormous advantage in hospital planning. The only question was how far this plenum system

would sufficiently ventilate the wards, and as to the proper lighting of the wards. He had not seen the Victoria Hospital, Belfast, but had only seen the photographs, and naturally one felt how bold it was to light these wards only from the top. With regard to the ventilation and as to what Dr. Childs had said, he must say that the plenum system seemed to have the advantage of passing the air over the body more rapidly than by any other system he could imagine. It enabled them to some extent to control and regulate the amount of air passing in front of any particular room. With regard to what the disadvantages might be, he quite agreed that the more they could talk it out the better, and, as he had said, they would, if they could, have another meeting to hear both sides. They were all great believers in hearing both sides in order that they might have the truth of the thing. They were very pleased to have Mr. Henman there that night. He used to meet him at the Classes of Design at the Architectural Association a great many years ago, and had often seen him since, and he had also had the pleasure of working with Mr. Lea for a great many years, so that they were both old friends of his, and he was sure those present would join in a hearty vote of thanks to them for bringing the novel and original arrangement before them, which was what the Institute wanted. When any one was bold enough to attempt anything of that sort, and was good enough to bring it before that Institute, they were under a debt of gratitude to them.

The motion was heartily agreed to.

Mr. Henman, in reply, said he would only make one remark with regard to the plenum ventilation. He was perfectly certain that Dr. Childs had never properly investigated a building well ventilated on the plenum system. There were a great many buildings which had been attempted to be ventilated on the plenum system, but as a rule they were very badly done, and Dr. Childs might have come across a bad example. A proof of the advantage to a hospital of plenum ventilation was that they could go into the wards in any one of the twenty-four hours of the day and find the wards absolutely the same in freshness and purity. He had, in going about the country, visited hospitals, and he invariably asked how they ventilated the wards, and he was told that they were sometimes rather smelly, and he had been told that they "simply stank." Nothing of that kind occurred with plenum ventilation, and if that was not good enough he did not know what was. By that system they got the movement of air, but they did not get bad draughts, which often gave patients other diseases which they did not have, and would not have, in wards ventilated on the plenum system. The wards at the Birmingham Hospital and the Belfast Hospital were the same all the twenty-four hours of the day and night.

Mr. H. Lea also briefly responded, and said that he would be glad to attend a future meeting and listen to the criticism offered, and as far as possible answer such criticism.

The President announced that a business meeting for the election of members would be held on January 4, 1904, and that Messrs. G. A. T. Middleton, J. W. Beaumont, J. Woolfall, E. C. Down, and H. Davis had given notice that at the meeting they would bring forward the following motions:—"1. That this Institute is in favour of the general principle of the compulsory examination and registration of architects. 2. That a committee be appointed to consider what steps should be taken to give effect to this principle, and to report thereon to a special general meeting before the opening of Parliament. 3. To nominate this committee."

THE ARCHITECTURAL ASSOCIATION DISCUSSION SECTION:

THEATRE PLANNING AND CONSTRUCTION.

THE following is part of a paper on "Theatre Planning and Construction," read by Mr. H. T. B. Spencer, A.R.I.B.A., before the Discussion Section of the Architectural Association on the 6th inst., Mr. J. H. Pearson in the chair:—

The disposition of the site has naturally the greatest influence on the plan, and the decision as to what extent the building is to be sunk in the ground must also depend partly on the site. It is as well to remember that if the "pit" is sunk in the ground the "gallery" will not be so high above the pavement level, and, therefore, there will be less distance to descend in case of a panic; but, on the other hand the cost of excavation and the provision of necessary vertical asphalte rendering on the walls below ground would counterbalance the saving in the external architectural treatment unless very costly.

The highest part of the area or pit must not be more than 6 ft. above the pavement, and its lowest part must not be more than 15 ft. below it, and must in any case be capable of being drained into a public sewer. The joint effect of these two regulations is that with a level site the theatre must always be sunk to some extent, in respect, that is, to the stage cellar and part of the stores floor; but it imposes a limit which is prescribed by the depth of the sewers. This is the external factor, so to speak, in the problem we have to solve. Another, which may be called the internal factor, is that the stalls people, who will enter from the main thoroughfare, have to get past the pit folk to their seats not far from the proscenium, while the occupants of the pit will generally have to be admitted and seated somewhere between these two points. For this latter reason I may say at once that it is nearly always more convenient to sink the theatre to its maximum distance below pavement level, assuming that the site has no extraordinary features as regards levels, etc.—Remembering that every part of the theatre should be drained, and that the stage cellar, even if there is no well, will be at least 5 ft. below the stalls floor, this floor will probably be between 8 ft. and 9 ft. below pavement level, and about 3 ft. below the back of the pit. By setting up your line of sighting for the pit and dress circle, you will obtain the minimum height of the dress circle back, or foyer, which in this case will probably be 6 ft. of 7 ft. above pavement, and about 15 ft. above the pit back.

We still have the second half of our problem to solve, namely, how to get the stalls people from the crush-room to their seats in the area. This brings us at once to the consideration of two distinct types of plan. There is, however, one usual feature common to both, the above-mentioned open space or wide corridor at the back of the dress circle, used as the foyer, and from which you generally find corridors and staircases on either side of the dress circle tier, leading to lower exits on the tier and to the private boxes.

The two types differentiate on lines which will be dicided by the answer to this question: Shall the stalls people come up from the crush-room to this foyer, and thence reach their seats by the continuation of the staircases at the sides of the dress circle tier, or shall they have an exclusive access to their own part of the house? If the former plan be adopted, it is advisable to keep the dress circle back at its *minimum* distance, and to raise the crush-room by three or four steps above the pavement level in order to reduce the number of steps up to the foyer. This gives at the same time increased headway to the pit saloon, which may conveniently be under the crush-room. The foyer saloon can usually be placed over the crush-room, and, together with the foyer be used jointly by both the stalls and the dress circle. It is convenient in this case to place the joint retiring rooms on the foyer level, and leave the crush-room free as a vestibule, with room for a box-office, with possibly room on the same level for the pit lavatories. If, as in the second type, the stalls are to have separate access to their seats, then you must keep the pit back low down, and the dress circle back as high as possible, keeping in mind the staircases from the crush-room. This allows of the provision of an intermediate landing or corridor between them for the exclusive use of the stalls, provided with staircases therefrom down to the area, and immediately underneath the first described staircases from the foyer. The stalls retiring-rooms will presumably have to be placed at or about the crush-room level. This may necessitate an open-air well being provided for the pit lavatories in the basement, as there would probably not be room to give them external walls above pavement level in compliance with the by-laws. The second type practically deprives the stalls of the use of the foyer and the foyer saloon, and therefore a separate saloon must be provided. This may often be placed somewhere below the crush-room level, which, however, tightens up the space we might otherwise devote to the pit saloon.

Special circumstances must, of course, decide which type is the most suitable, not only for the site, but also for the clientèle the theatre will cater for. But either of these two types will be found applicable to a level site or a sloping site—that is, sloping upwards or downwards from front to back. But whichever way this important question is settled, the planning of the upper tiers is "ceteris paribus" comparatively easy, care only being necessary to ensure good sighting. As you will perceive, the corridors right and left from the crush-room and foyer, giving entrances on each side of the different parts, with opportunities for extra exits therefrom, suggest a symmetrical arrangement of plan about a main axis running through the centre of and at right angles to the proscenium, and, if the site allows of it, of the crush-room as well. This symmetry of plan should always be the aim of the planner. The existence of a street down one side is presumed, and it is generally found necessary to provide a ten-feet private passage at the other. With this duplicate means of access it is easy to get at least two exits from each part, one on either side, and possibly also to dispense with the necessity of using the crush-room as an exit in case of panic. Speaking generally, the tendency of the regulations of the L.C.C., especially those dealing with the site, has been to make theatre plans more regular and the buildings themselves more compact and self-contained, which is a distinct advantage from almost every point of view.

The crush-room or vestibule should be as spacious as space permits, and should contain the box office and the necessary retiring rooms, and should be entered through double sets of doors enclosing a lobby to act as a draught check. The different pay boxes should be in easy communication with the chief box office where possible. The box office should not be too small, and should be comfortably arranged with a fireplace, as it is used nearly all day long. Convenient office accommodation, in addition to the box office, should be provided for the use of the management.

The number, size, and even the position of the saloons to be provided is a question on which the architect often receives definite instructions, which might, of course, considerably affect the plan. But should the settling of these and similar questions be left to him the architect must be guided by what may be called the "genius" of the theatre. In some houses you get almost the same class of people in both the stalls and dress circle, and perhaps to some extent in the "upper circle," and, therefore, there is no object in not permitting them the common use of the foyer and saloon. But in other theatres the stalls would be patronised by a set as distinct from that in the dress circle as the latter is from the upper circle, and, therefore, each has to be separately catered for. These remarks apply more particularly to theatres proper, and not to music-halls, which require a special and different type of plan.

It is only recently that the pit and gallery have been thought worthy of better accommodation, and as their occupants are said, like the third-class passengers on the railways, to be the best-paying clients, it is surprising that more attention has not been paid to them ere this. On the other hand, I may remind you that we have been promised some startling departures, according to recent public announcements, such as the total disappearance of the pit and gallery. I hope I shall not offend the susceptibilities of any enthusiastic pitite when I say that I should not regret the former. I have for some time thought that cheap reserved seats might well be provided in the space occupied by the unreserved pit, approached, perhaps, through the same entrance as the stalls, which would be a distinct economy. There would be no harm, that I can see, in the crush-room being used both by people in evening dress and those in morning dress but, if necessary, it would be easy to separate "the sheep from the goats" during the intervals by providing separate saloons for each. I am sure that reserved seats for about three shillings would be thoroughly appreciated by the general public, and I think that behind the stalls and at the back of the upper circle are the places where one ought to find them—somewhat, I believe, on the American plan.

In respect to the general distribution of seats above the ground floor, theatres are classed as two-tier or three-tier houses, three tiers being the limit allowed by the L.C.C. Sometimes the top or gallery tier is not constructed over the upper circle, but at the back of it, and somewhat raised above it. This is generally a cheaper form of construction, and while setting the back rows further back from the stage it does not raise them so high, and the sighting is, of course, easier. But to my mind the upper circle itself is not improved by this arrangement but by losing its privacy it is, on the contrary, spoilt. It is usual to provide

private boxes to the dress circle tier close to the proscenium, also to the stalls, and often to the upper circle, though most managers agree that these last are no good.

In important theatres the box on one side of the dress circle is called the Royal Box, being, as its name indicates, used by the Royal Family, in which case a separate retiring-room, with private lavatory, is provided, with a separate entrance from the street, exclusively used as a Royal entrance.

If the sighting be properly arranged, the whole of the enclosed area should be visible to each and every occupant of a seat. To do this comfortably, one must, for one thing, sit more or less facing the proscenium, and not sideways to it. This happy condition may be obtained by keeping the springing of the curve of the circle front back as far as possible; that is, by widening the face of the side boxes, and by keeping the curve somewhat flat and at its greatest distance, not too far back from the proscenium. It is advisable, also, to make the curve of the upper tiers concentric with those of the dress circle. The sighting line of the extreme sides ought to allow of any one sitting there seeing the back line footlights at a point close up by the proscenium jamb. It is not necessary to give a sumptuous view of the stalls and orchestra from the body of the tier; in fact, you cannot do that without setting the centre of the curve further back, and so diminishing the seating area. But, with no extra depth of auditorium at your disposal, it is possible to get more seats in a tier as just described than if the more familiar horse-shoe or semi-circular curve be used, with the great advantage that each seat commands a full view of the stage. . . .

I am prepared to admit that the above-described arrangement tends to the banking-up of the upper tiers, but, within limits, I do not see any particular disadvantage in this.

Tip-up seats are generally provided to the dress circle and upper circle, as well as to the stalls, and so fixed that there is a distance of at least 12 in. in the clear between the nearest points of succeeding rows measured between perpendiculars. If the tip-up seats are automatic, they should be constructed so as to tip back to an angle of about 45 deg. only, otherwise there is the risk of accident from sitting on the floor instead of the chair. The continuous seats of the gallery are sometimes placed direct on the top of the concrete riser, but there is an objection to this, as there is no space left to tuck one's feet away under the seat if so inclined, and the face of the riser is certain to get damaged. It is better, if a little more expensive, to provide seats on standards at the back of the tread. . . .

To facilitate the elimination of columns in the view of the sighting now rightly considered necessary, an ordinary plan is to throw a deep girder right across the auditorium, and rather less than half way back from the front of the tier, with secondary angle girders right and left resting on the main girder and the side walls, and tangential, as far as possible, to the curve of the treads. Through the webs of these run the shaped cantilevers, with their tail ends built into the brickwork at the back, or otherwise weighted down. If there is an enclosed back to the dress circle and upper circle tiers, advantage may be taken of this to provide small columns resting on the tail ends of the cantilevers below, and carrying the girders of the tier above. But, of course, the exigencies of each particular plan decide the best form of steel construction to be used, which, in fact, is generally left to the engineers to work out. The architect must know enough of steel construction to so plan his tiers that the engineers are able to go on the line of least resistance, so to speak, and not have to bring back the scheme with the remark that the plan involves very expensive construction. . . .

The number and size of the dressing-rooms will depend, of course, on the particular kind of performance for which the theatre is intended. If for chamber plays, a few small rooms near the stage level for principals, and some larger rooms to hold three or four each, will be all that is necessary. For musical plays, pantomimes, and melodrama, large rooms for the male and female chorus, dancers, or supers, must be provided in addition. There must be suitable wardrobe accommodation, and also separate and sufficient lavatory accommodation for both sexes. It is usual now to provide hot and cold water services to the dressing-room basins, which are fitted with proper wastes. The large dressing-rooms, and often the principal's rooms, have continuous dressing tables with mirrors, and the lights arranged to light both sides of the face for making-up purposes. Each room will require small stoves for curling tongs and grease paints, heated either by gas or electric current. A passenger lift, that may also be used to carry up the artistes' baskets, is of the greatest convenience, both in the dressing-room block and in the office accommodation. . . .

There is a certain amount of accommodation to be provided on and about the stage that I will briefly note. If limelight is likely to be used, fireproof chambers must be provided for the tanks, with direct ventilation through an external wall. The resident engineer and his assistants, as well as the stage carpenter, should be accommodated with an office and workshop, which must be fireproof chambers with iron doors, and ventilated through an external wall. The stage manager will require an office on the stage level, and, if possible, communicating directly therewith. As most theatres are provided with orchestras, a separate room must be set apart for their use, in which their instruments and music may be locked up, and if music forms an important part of the entertainment, the musical conductor should have a room for his private use. It is unnecessary to provide a painting-room for the use of the scenic artist, as most of the scenes are now painted in the artist's own studios, or elsewhere. A property-room is necessary, and should be a fireproof chamber with iron doors, and direct ventilation through an external wall. There is a tendency to store scenery and properties away from the theatre, which is to be encouraged, for, without a doubt, the accumulation of such material is quite as fruitful a cause of outbreaks of fire as its legitimate use during the performance. . . .

The discussion, which was opened by Mr. Max Clarke, turned largely upon the regulations of the L.C.C., which aim at the prevention of the spread of fire and the safety of the public. Twenty or thirty years ago, said Mr. Clarke, liberties were taken by the builders of theatres, whereupon the authorities had tightened the strings. We were suffering for the sins of those days, as the tendency was not now towards a slackening. But why were such elaborate precautions taken in the structure and yet the scenery permitted to remain so highly inflammable? He did not believe in the fire-resisting qualities of the asbestos curtain. Something more rigid was required. As regards the slope of the stage, there was a tendency towards something less than the ½ in. to the foot, even to making it quite level: but if that were done the slope of the pit floor would require to be considerably increased. He thought the steel stage, after the manner of the example shown at the Earl's Court Fire Exhibition, destined for Covent Garden Theatre, might come into more general use. Mr. Clarke also sounded a warning note as to the use of constructive ironwork without ensuring its being absolutely protected against the action of rust. Some of the iron girders exposed to view in the Metropolitan Railway stations were instructive in this connexion.

Mr. L. Ambler said he could only speak about theatres from the visitors' point of view. He had been struck by the number of theatre architects who had recently come upon the scene, in spite of the difficult and complicated nature of the work. The finding of suitable sites seemed to be the most difficult thing of all, however. The crush-room accommodation was invariably too small in London theatres, and the saloon and refreshment accommodation, especially in "pits," inadequate, and was deserving of better attention on the part of managers and their architects. An endeavour might also be made towards a better architectural treatment or grouping of the various exit doors, instead of their appearing like so many "accidents" in the design. Why not a form of colonnade treatment, which he thought space might, on some sites, permit.

Mr. G. H. Lovegrove said he remembered some years ago going over the old Grecian Theatre while it was in course of demolition, where the weakness of the timber construction formed a remarkable contrast to our more modern work.

Mr. J. W. Stonhold said he thought it was hard on theatre ironwork to compare it with that of the Metropolitan Railway, where it was not only exposed to the weather, but to fumes which acted on the iron. In fact, he thought the tendency in modern ironwork was to err on the strong side. Additional crush-room accommodation was a question of cost. Flanking or rear walls of theatres might with advantage be made a little less like prisons in appearance; a window here and there might well be inserted with some benefit internally.

Mr. T. Sudsuki, by means of the blackboard, gave a most interesting description of the plan and working of the typical theatre of Japan. The "revolving" stage was explained in detail, and its advantages for quick change of scene demonstrated. The theatres are, of course, on account of the frequency of earthquakes, built entirely of timber. Lateral curtains were used; in fact, admiring playgoers were wont to bestow upon the management of the Japanese theatre "presentation" curtains. Special provision, therefore, had to be made at the sides of the proscenium opening for the hanging of these curtains in due order.

The Secretary read a letter from Mr. Ernest Runtz on the subject of the paper, in which Mr. Runtz said that although the regulations of the L.C.C. were in the right direction they might be considerably modified in some particulars and extended in others. He suggested than a conference between theatre architects, managers, and the authorities might be arranged, and if the constitution of a board of arbitration could be agreed upon it would tend to the benefit of all concerned, including the public. In respect to the heights of tiers, pure air was more important than height, and could be obtained if the ventilation was designed on the propulsion system.

Mr. A. Blomfield Jackson, as Special Visitor for the evening, wound up the discussion. He said that the authorities had a difficult task to perform, and that they, as architects, were much indebted to them for the way they endeavoured to carry it out. He could understand the necessity for a minimum width of street on the boundary of a theatre, and that everything which would contribute to the speedy and safe exit of the audience into the street ought to be strictly enforced. But he thought that having enforced every provision for getting the people safely out of the theatre, the duties of the authorities might stop there, and the strictures as to fire-resisting construction, which added so much to the cost of building, considerably relaxed. Although it was quite essential that there be no projections whatsoever on the exit walls, he thought some suitable architectural treatment of a corridor above shoulder height were possible. The proscenium made ventilation and warming difficult, as it was next to impossible to get exactly the same temperature on either side of it when down. When the curtain was raised, therefore, draughts occurred. Self-closing iron doors were in practice no good. As they would not stay open, the stage hands simply *wedged* them open. In the case of a fire, therefore, no one would think of the wedges, and the doors would, of course, not close. The aim, therefore, defeats its purpose. It was a very difficult matter to secure a suitable site in London. Ground rents were enormous, so the planning of the seating had to be largely a matter of returns from the financial point of view. The crowding of the seats, therefore, was not always attributable to the bad planning of the architect, but to pressure from the managers. This also accounted for the smallness of crush-rooms, saloons, etc.

ARCHITECTURAL ASSOCIATION CAMERA AND CYCLING CLUB.

ON the 9th inst., Mr. F. J. Steadman, of the Lumière N. A. Co., gave a demonstration of colour photography, dealing first with the theory of the subject and the colours of the spectrum. He then described the process advocated by the Lumière Co., in which three negatives are taken, the first through a blue screen on an ordinary plate, and the others through red and green screens respectively, on specially-prepared plates which are sensitive to these colours. These negatives are printed on a bichromated gelatine emulsion spread on celluloid or talc, giving a barely visible image which is developed in hot water and fixed in hypo in the usual way, leaving a clear film with almost invisible image. The film is then dried and dyed in a complementary dye; that is, the print from the negative taken through the blue screen is dyed green, that through the red screen blue, and that through the green screen red.

These prints are then superimposed, and the dyes adjusted; the blue print being taken as the basis, and the other dyes either intensified by further dying or reduced by washing until a perfect transparency in natural colours is obtained. For prints, a thin, flat bromide print is made from the negative taken through the red screen, and toned with iron to a blue tint. Dyed positives on a stripping film are then made from the other negatives, and squeegeed one at a time to the blue print dried and the talc support stripped, the result being a paper print in natural colours. The exposure required for the three negatives is through the blue screen, four times the ordinary exposure; through the green screen, six times; and through the red, from eight to ten times. A white object should be in the pictures as a guide when developing, because its density will be the same in all three negatives, and the negative taken through the blue screen should be taken as the standard for density when developing, as it is less sensitive to the ruby light of the darkroom.

Prints showing the various dyes and the combined result were then handed round and discussed. Mr. Steadman composed two prints from their separate parts during the discussion, to show the ease with which the superimposition was made. The lights were then turned down, and a short demonstration of the theory of colour was given by means of the lantern, after which a remarkable series of photographs of landscapes, fruit, still life, and architecture was shown, which had been prepared in natural colour by the Lumière Co.

Mr. Louis Ambler, in proposing a vote of thanks to Mr. Steadman, referred to the crudeness of colour and lack of atmosphere in the photographs of landscapes shown, and was informed that this was at present unavoidable, but very curiously was only found in landscape work. Mr. Stonhold, in seconding the vote of thanks, suggested the use of the process in photographing stained glass and other coloured decorations in buildings.

Mr. Wonnacott put the vote of thanks to the meeting, and gave a brief *résumé* of the history of colour photography, afterwards inviting the members of the Camera Club to be present as his guests at Sir William Abney's lecture on colour photography at the Royal Photographic Society on December 14.

ARCHITECTURAL SOCIETIES.

LIVERPOOL ARCHITECTURAL SOCIETY.—On the 7th inst., in the Law Libraries, Cook-street, under the chairmanship of Mr. John Woolfall, and the auspices of the Liverpool Architectural Society, Miss Ethel Charles, A.R.I.B.A., London, read a paper entitled "Reflections on Architecture." The President, in introducing Miss Charles, described it as a unique privilege to introduce the first fully-qualified lady architect to his confreres. A moment's reflection would show them that those professions to which ladies had already been admitted had not lost any prestige thereby. As examples he mentioned painting, music, medicine, literature, etc. As to the possibilities of architecture as a paying profession for ladies time alone would show, but he believed they would be useful members of the profession, more especially in domestic architecture and in the planning of houses, where many labour-saving methods were desirable. Miss Charles, in the course of her paper, dealt principally with London modern architecture with the object of showing that its quality was as true and noble as that of the old days. She was cordially thanked on the proposition of Councillor W. E. Willink, seconded by Mr. T. E. Eccles.

MANCHESTER SOCIETY OF ARCHITECTS.—The annual dinner of the Manchester Society of Architects was held on the 11th inst., at the Queen's Hotel. The President of the Society (Mr. J. W. Beaumont) was in the chair. Supporting him were the President of the Royal Institute of British Architects (Mr. Aston Webb), Mr. Thomas Kay, Mr. Alfred Darbyshire, Colonel Eaton, Mr. Henry T. Hare (President of the Architectural Association), Mr. Butler Wilson (President of the Leeds and Yorkshire Architectural Society), and others. The President proposed "The Royal Institute of British Architects." Mr. Aston Webb, replying, made a sympathetic reference to Mr. Alfred Waterhouse, whose name is so closely associated with Manchester as the designer of the Town Hall and Assize Courts, and who, his Manchester friends would be pleased to know, was enjoying a quiet and happy life. They could not but regret that a brain so active and a hand so busy had been stayed, and they accorded him a full-hearted sympathy in his retirement. Mr. Alfred Darbyshire proposed "The Manchester School of Architecture," to which Mr. T. Kay and Professor Capper replied. Professor Capper spoke hopefully of the prospects of the new school, and appealed to architects and the public for support. Mr. Aston Webb suggested that the authorities of Manchester would do well to take counsel with the Manchester Society of Architects in regard to public improvements.

SHEFFIELD SOCIETY OF ARCHITECTS.—The usual monthly meeting of this Society was held in the Lecture Hall of the Literary and Philosophical Society, Sheffield, on the 10th inst., Mr. T. Winder, Sheffield, presiding. A vote of condolence with the family of the late Mr. W. F. Hemsoll, a Fellow of the Society, was accorded by the meeting. Mr. Theodore Fyfe, of London, then gave a lecture upon the "Excavations in Knossos." He referrred to the fact that in the year 1900 Dr. Arthur Evans acquired full rights of digging over the central part of the Knossos Hill. Since then the work of excavation has proceeded steadily for four seasons, and there seems every prospect of a fifth. A great palace has been brought to light (continued the lecturer) larger than any others of the Mycenaean age, on the mainland of Greece, belonging to a period anterior to these, but in many ways historically connected with them. The evidences of an extensive town have also been found, in the vicinity of the palace. The amount of material that has been discovered is enormous. Probably no other site, either in Greece or Egypt, has yielded such a variety of small finds, many of which, as well as the architectural features of the palace, are new, and of the first interest. The term Minoan has been fitly applied by Dr. Evans to the earlier, central, style of Crete. The Minoan dynasty divides itself into early, middle, and late periods. The existing palace belongs to the later Minoan period, but building remains also exist of the middle period. This middle period produced the finest pottery known in the Ægæan—exclusively Cretan, and undoubtedly the main source of all later Ceramic styles known as "Mycenæan." Before Cretan exploration, from about 1500 to 1000 B.C., was generally accepted for the so-called "Mycenæan" age. The chief part of the existing palace at Knossos was probably all built before 1500 B.C., and stretches back beyond 2000 B.C.; the perfection of the Minoan style being probably reached at some time between these dates—about 1800 B.C. Two Egyptian finds at Knossos are evidence of intercourse between the earlier palace period and the Shepherd dynasties of Egypt. The later palace period is more or less contemporary with the Egypt of Thothmes III. In considering the plan of the Palace in detail, the first thing evident is its domestic character. There is no attempt at exact regularity or symmetry; on the other hand, everything seems planned for convenience and comfort. The western portion consists mostly of basement in its present state. Here, we have the more public and administration part of the building with ample magazines for stores, the judicial throne room, and to the west, a vast court with the great ceremonial entrance, where the king may have sat in the gate. The other principal entrance is on the north, and evidences show that a great roadway must have existed here. The eastern portion of the palace contained the domestic quarters of the king and his family; adjoining, we find palace workshops and stores, perhaps kitchen apartments, and magazines for utensils. Here, also, must have existed a great system of halls entering off the western court. From the importance of its fresco finds, Knossos deserves the title of a second Pompeii: the evidence that it affords a highly developed School of the Arts is fully borne out by other finds—works in ivory, crystal, gold, enamelled porcelain, pottery, and fine stone. An astonishing capability of working in any material is evident. The art of painted plaster is extended to the production of full-size reliefs, artistically superior to any hitherto known work of the period. This is all the more remarkable when we consider that this School of the Arts existed hundreds of years before the first beginnings of Greek civilisation. Another extremely important find consisted of some 1,600 clay tablets, inscribed with a highly developed system of writing. These chiefly appear to be palace archives, in the form of accounts. The appearance of the palace in its pristine glory must have been very magnificent, taking into account the large scale and beautiful workmanship of the painted plaster, the fineness and brilliancy of the colouring material, and the effect of judiciously contrasted colours. The only things which can be compared to its frescoes out of Egypt are some Roman paintings, certain Byzantine mosaics, and in our own time some coloured tile work, some frescoes by Puvis de Chavannes, and some example of the revival of coloured plaster relief. But the ancient examples often show a perfection of relief which Donatello might have envied, and a permanence and brilliance of colour which has remained quite unsurpassed. The lecture was illustrated by lantern slides, exhibited by Mr. J. Atkinson, of University College. On the motion of Mr. J. B. Mitchell-Withens, seconded by Mr. C. F. Longden, a hearty vote of thanks was accorded to Mr. Fyfe for his interesting and instructive lecture. —*Sheffield Independent.*

GLASGOW ARCHITECTURAL ASSOCIATION.—The fourth ordinary meeting of the Glasgow Architectural Association was held in the Hall of the Philosophical Society, 207, Bath-street, on Wednesday, the 9th inst., when a paper was read by Mr. Theodore Fyfe, architect to Dr. Evans' excavations at Knossos, which was mainly a repetition of that reported above as read before the Sheffield Society of Architects. A discussion followed the reading of the paper, in which Mr. Newberry, Mr. Bromhead, and others took part.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—A vote has just been taken of the members of the Birmingham Architectural Association upon the question submitted by the Council of the Institute of British Architects of the desirability of a scheme for registration of architects and their admission to the register by compulsory examination. There are 175 members of the local association, and the result was announced on the 11th inst. by the President (Mr. Arthur Harrison) at a meeting of the members of the Birmingham Association, held at the Norwich Union Chambers. The voting was as follows: 64 for, 12 against.

NORTHERN ARCHITECTURAL ASSOCIATION.—A meeting of the Northern Architectural Association was held on the 9th inst., at 36, Northumberland-street, Newcastle. Mr. J. W. Taylor (President) occupied the chair, and Mr. G. S. Aitken (Edinburgh) gave a lecture on "Bothwell Castle," with lantern illustrations. The following nominations were agreed to: Associate, Mr. L. G. Ekins, Jesmond; students, Mr. Ash (Gateshead), and Mr. A. G. Walton (Cullercoats). Votes of thanks brought the proceedings to a close.

ULSTER SOCIETY OF ARCHITECTS.—The annual meeting of this Society was held on the 8th inst., in the Ye Olde Castle Restaurant, Castle-place. In the unavoidable absence of Sir Thomas Drew, Mr. W. J. Gilliland (Vice-President) presided. The minutes of the last meeting having been read and confirmed, the Hon. Secretary (Mr. N. Fitzsimmons) read the report of the Council, which contained the following:—"The work of the past year, although not of the eventful character of previous years, has been none the less satisfactory in that the position of the Society has been materially strengthened, its influence extended, and the various matters affecting the welfare of the profession in this province carefully watched and its interests as far as possible safeguarded. The important question of the registration of architects was fully discussed at a general meeting, and the following resolutions were passed unanimously:—'That the absence of restriction of the use of the title "architect" to those properly qualified to use same is a great injustice to architects who are so qualified, and seriously retards the progress of architecture in Great Britain and Ireland.' 'That it is the duty of the Council of the Royal Institute of British Architects, as representing the profession, to make an immediate and serious effort to obtain statutory powers for the purpose of establishing such restriction.' Copies of these resolutions were sent to the Royal Institute of British Architects and to the Royal Institute of Architects of Ireland, and it is gratifying to be able to announce that the latter body, on the motion of one of your representatives, also carried these identical resolutions unanimously." Mr. Seaver (Hon. Treasurer) submitted a statement of account, showing a satisfactory balance to the credit

of the Society. The reports were adopted, and the following officers were elected:—President, Mr. W. J. Gilliland; Vice-President, Mr. J. J. M'Donnell; Hon. Secretary, Mr. W. B. Fennell; Hon. Assistant Secretary, Mr. W. Hartley Patterson: Hon. Treasurer, Mr. H. Seaver; Council, Messrs. N. Fitzsimmons, F. H. Tulloch, and R. M. Young; Associate Members of Council, Messrs. T. Houston and E. R. Kennedy; Auditors, Messrs. J. St. J. Phillips and Vincent Craig. The proceedings then terminated. The annual dinner was subsequently held in Ye Olde Castle Restaurant, Mr. Gilliland presiding.

ARCHÆOLOGICAL SOCIETIES.

BRISTOL ARCHÆOLOGICAL SOCIETY.—By permission of the committee of the Literary and Philosophical Club, the first meeting of the winter session of the local members of the Bristol and Gloucestershire Archæological Society was held on the 9th inst. at the club. Mr. F. F. Fox, President of the Council, was in the chair. The President explained the objects of the scheme, which were to promote local archæology, and to pleasantly bridge over the long interval between the autumn and spring meetings. In this way, too, some interesting papers should be provided for the proceedings. They were much indebted to Mr. J. E. Pritchard, the Bristol hon. secretary, for taking up the movement and bringing it so successfully to that stage.—Mr. Pritchard gave a summary of the letters of approval of the scheme, and said plenty of material had been promised in the shape of papers, etc., for three or four evenings during the winter. Canon Bazeley, the hon. general secretary, congratulated Mr. Pritchard and the Bristol members of the Society on this excellent start, and said the example had inspired Gloucester members to do likewise. He hoped that Cheltenham, Stroud, and other towns would follow. The President handed round a copy of a rare seventeenth century book, printed at Rome—"Carminum Jacobi Albani Ghibbes"—bound in vellum and containing a quantity of verse. Mr. W. R. Barker showed and described the bronze dagger found recently at Avonmouth, between Dunball Island and the dock. Mr. Pritchard exhibited bronze weapons found locally. Mr. W. R. Barker then read a paper on "The Warden's Horn of the Manor of Billeswicke," after which Mr. Were offered some criticisms of the Merchant Venturers' Arms, which he said departed in several details from the grant. The picture on the grant, he surmised, was not the original drawing, but one painted over it. The two important departures were the introduction of a ducal crown and the variation of the lion passant to a pion passant guardant. He also protested, in the interests of pure heraldry, against the unauthorised representations of the Arms of the City and the See. Mr. Pritchard then read a paper on "The Mercers and Linen Drapers' Company of Bristol," prepared by Mr. J. Latimer. Dr. Alfred Harvey read a paper on "Agrarian Castles of Went," which dealt with the number of castles between Chepstow and Newport—three in Lower Went, Caldicott, Pencoed, and Penhow; and three in Upper Went—Dinham, Llanvair, and Castroggy. Two others are mentioned in early records—Talgarth and Llanvaches—of which there are no remains. Caldicott was at one time a Royal, and always more than an agrarian castle; the others were all small, consisting of a house and a fair-sized enclosure, protected by strong curtain walls, where tenants or dependents could drive their herds in disturbed times. Penhow alone has a small keep, or peel-tower, though probably Dinham had the same feature. The others were all quadrilateral, with drum-towers at the angles, and with the residential buildings erected against one curtain wall, which at Castroggy and Llanfair was pierced by the windows of the hall. There was no trace of a chapel at any, and a gatehouse at Pencoed only, and that a later one. Most, if not all, had later additions. Pencoed, on the summit of the low range of hills south of the highway, is said to be the earliest. It belongs to the time of Henry III., and was in 1271 the property of De Mora, or Moore, from whose family it passed to the Morgans, who held it to the seventeenth century. It was garrisoned for the King during the Civil War. Pennow, the finest in situation, overhanging the high road, is also the most picturesque and interesting. In the thirteenth century it belonged to the Seymours, or St. Maurs, and was the cradle of both the Somerset and Hertford families. Llanfair, built in the thirteenth century by Robert Pagan, or Fitz-Payn, became afterwards the property of the wealthier Mont Leemer (son-in-law of Edward I.) and his descendants, the Montacutes and Nevilles, and at their hands received large additions, becoming a castle of fair size. Castroggy, the only castle on the northern slope of Wentwood, was built by Roger Bigod, Earl of Norfan, and Lord Manchu, in the reign of Edward I. It is a small castle, near the old road through Caerwent to Usk, in a position of much beauty, but not very accessible, and is much ruined Of the little Castle of Dinham, in a secluded coombe near Caerwent, little remains but a shapeless heap of stones. Apart from their individual and local utility, these castles formed part of a systematic plan for guarding the high road into South Wales, the one landing-place between the Wye and the Usk, and the road from Bristol and the South to Usk and Central Wales.—Votes of thanks were given to the contributors and to the President.—*Bristol Times.*

THE SANITARY INSTITUTE:

THE FLOODING OF BASEMENTS IN LONDON BY SEWAGE.

A SESSIONAL meeting of the Sanitary Institute was held on Wednesday, the 9th inst., at the Parkes Museum, when a discussion took place on "The Flooding of Basements in London by Sewage." The discussion was opened by Mr. Maurice Fitzmaurice, C.M.G., M.A., Engineer to the London County Council, followed by Dr. H. R. Kenwood, M.B., and others. The chair was occupied by Sir Benjamin Baker, K.C.M.G.

Mr. Fitzmaurice said the subject was a large one. There were two kinds of drainage in London: the main drainage, which the London County Council deals with, and the local drainage, which was in the hands of the Borough Councils, the City of Westminster and the Corporation of London. Both dovetail into each other, and were absolutely dependent one on the other. If the County Council were not able to carry off the drainage from the local sewers, there was flooding of both the local sewers and the L.C.C. sewers, but if the local sewers were not able to do so, and the sewers of the L.C.C. were, there was flooding only in the local sewers: the local sewers might be overcharged and inadequate, and the County Council sewers with little in them. Although he was officially connected with the County Council, yet he wished to speak on that occasion as a private individual. He had, perhaps more than any one in London at the present time, a knowledge of the amount of flooding which occurred during last summer. The owners of nearly every basement which had been flooded had written to the L.C.C., most of them demanding compensation, and those letters were passed on to him as the Council's Engineer. But those owners had also written to the Borough Councils, and those letters, too, had been sent to him, and he had had two letters of complaint about each flooding. As a result of those letters, a large map had been made showing all the streets on each side of London. The position of those basements about which complaint was made was indicated on that map, and thus a definite record was obtained in regard to each district, and it was possible in this way to see at a glance where the flooding had been most severe. It was possible to judge from the map how very extensive the flooding had been this last summer. On the north side of the Thames, the Boroughs which had suffered most were Hammersmith, Kensington, and Hackney, and on the south side, Battersea, Wandsworth, and Southwark, and the floodings had been among poor people who were least able to bear the cost resulting from their cellars being flooded.

He must divide the floodings into two classes:—(1) Those floodings which were due to the exceptional rainfall of this year, and which had never been flooded before, and (2) those which had been flooded before for several years in succession, and in which, in some cases, the flooding had been increasing year by year. As to the first class, the rainfall this year had been absolutely exceptional, and the fall for the year so far exceeded 40 in. On one day this year there was a fall of $3\frac{1}{3}$ in. in the twenty-four hours in London, on four or five days 1 in. of rain had fallen, and on twelve days during three months there had been more than $\frac{1}{2}$ in. of rain in London. From the G.W. Railway the Thames on several occasions could be seen as a lake, the water extending right up to the houses, with the result that the cellars were flooded. He had not seen it proposed that a second river should be made to carry off this water, but that would be just as sensible as were some of the proposals in regard to the floodings of these basements. To ask the County Council to deal with floodings consequent upon this exceptional rainfall, which might only occur once in 100 years, was obviously unreasonable.

The floodings of the second class were those which had occurred during past years in districts where undeveloped building land had been rapidly covered by houses, and where, in the case of exceptional or heavy rainfall, there was an increasing strain upon the sewers. He thought an attempt should be made to put an end to such floodings, and he wanted it to be known what powers the L.C.C. had in regard to low-lying land. The Council had the right where houses had been built on land which was below the level of high water, to insist that no basement snould be connected with the sewers, and that the basements should be made watertight. That completely prevented these floodings, and he thought it ought to be considered whether basements in other parts of London ought not to be dealt with in the same way. With basements in old houses it was not possible to do this, for although those basements might be cut off from the sewers, there would be floodings through the floors if they were not watertight.

Mr. Fitzmaurice then described the way in which the main drainage of London had developed. Before 1855 the drainage of London delivered into streams which delivered into the Thames, and, of course, the Thames became very much polluted. Moreover, during high water it was not possible for the sewers to discharge into the Thames, and consequently it backed up and lay stagnant. Sir J. Bazalgette then constructed intercepting sewers, and the sewage was carried to Barking and Crossness on the north side of the river. Sir Joseph also built a large number of main sewers, the total length of which, now under the control of the Council, was about 300 miles. This provision made it easy to deal with the sewage, but the difficulty was the storm water, and Sir Joseph dealt with this by a system of overflow storm sewers which delivered into the Thames, and pumping stations were built at certain places in order that the storm water might be lifted into the river at high water. One could not but admire this arrangement, and Sir Joseph ought to have credit for his great foresight in providing a scheme with which, until about 1890, there was little to complain about in regard to the sewering of London. The population of London at the time Sir Joseph designed these works was about $2\frac{1}{2}$ millions, and he designed those works for a population of $3\frac{1}{2}$ millions, and $\frac{1}{4}$ in. of rain in twenty-four hours. We know that the population is about 5 millions, and that the rainfall entering the sewers had greatly increased. The area had remained constant, but as it had got built over, and as the previous soil had been built over, the rain went into the sewers much more rapidly than it used to do. The sewage was not the difficulty; but the suddenly increased storm-flow was.

One of the first acts of the L.C.C. was thoroughly to investigate the question of the main drainage of London, and for that purpose they consulted Sir Benjamin Baker and Sir Alexander Binnie. These engineers made their Report to the Council in 1891, and the Council gave orders that the necessary plans should be got out in accordance with that Report. In 1895 the Council fully considered the plans, and many members of the Council thought at that time that instead of making an enormous new system of main drainage it would be possible to deal with the storm water alone by taking it from the flooded areas, and the construction of large intercepting sewers each side of the river was therefore put off for some time. That, as was known, did not prove successful. Another reason which made the Council delay the construction of the large works referred to was that at that time the question of bacterial beds was coming up, and it was not desired to do anything which would prevent the Council taking full advantage of any bacterial system which might be adopted, and he thought the Council were wise in not taking up any bacterial system at that time, or even now. Even now there were many people who were not sure what was the right system

of bacterial treatment. There were several systems and there were advocates of each, and he did not think finality had been reached in regard to bacterial beds, though he hoped there soon would be. He was not oposed to bacterial systems—quite the reverse—but he wanted to be certain before recommending the Council to adopt any system. In 1895 the Council carried out many storm-relief sewers, and they strengthened the pumping power of the various stations, but the result was not what had been expected, and in 1899 proposals were placed before the Council by their Engineer, and these were now being carried out. The Council had to take a much broader view of the matter than might appear to be right in different districts. It was quite possible to relieve floodings in Islington, for instance, but that would immediately increase floodings in Hackney. It was quite easy to relieve floodings in Battersea, and increase them in Lambeth. The County Council had to consider the matter as a whole, and also the purity of the river. The Council decided in 1899 to build new outfalls and new intercepting sewers, and gradually to work westward. As to the Thames, he thought there were very few complaints now as to its purity. He was an advocate for sending the storm water into the Thames, but only when the capacity of the sewers was increased sufficiently to leave ample room for the first storm water to be taken down to the outfalls. After that first water was taken away, the rest could be discharged into the Thames, for it was practically pure rain water. The first flow of storm water off the street was as bad as any sewage which went into the sewers, and it would be a monstrous thing to allow this to go into the Thames. The Council sent an enormous quantity of sludge out to sea at great cost, and if they sent the first storm water into the river, they would be wasting that money. People seemed to think that little was being done, and had been done, as to the main outfall sewers, but this could only be due to ignorance; on the north and south sides of the river great works had been or were being carried out. A work like the main drainage of London could not be built up at once; work involving an expenditure of 3,000,000*l.* or 4,000,000*l.* could not be carried out in the course of a year. The programme of work in 1899 involved an expenditure of 1,250,000*l.* in relief works, and up to the end of 1903 the Council authorised the expenditure of 320,000*l.* As a matter of fact, 500,000*l.* had been spent, and during the next two years they expected to spend another half million on new sewers. This was a rate of work which no one need be ashamed of. The Council were doing their best to deal with the evils which existed, but that would be of no avail if the Local Authorities did not see that their own sewers were capable of dealing with storm waters. If they did not, there would be floodings in the local sewers, while the County Council's sewers would be half empty.

Dr. Kenwood, Medical Officer of Health for Stoke Newington, said he had only just learnt how much energy the Council had recently been displaying in the matter. But he admitted that the London County Council during the last year or two had displayed some energy in carrying out relief works; still, the dreadful and disgusting experience of this year would have been spared the inhabitants in London if the London County Council had not required ten years of complaints, memorials, and reports from their officers, a mandamus issued by the Lea District Board, and a threat to bring the Council's faults in front of the courts of law, before it could bring its mind to act. All the complaints had not reached the Council, for people felt it was hopeless to complain. Workrooms, living-rooms, sleeping-rooms, underground bakehouses, and cellars had been flooded from time to time with 1 in. to 1 ft. of sewage, and oil-cloth, carpets, and other goods were spoilt or injured. These flood-waters left behind them a coating of evil-smelling sewage. Medical officers of health and others felt very strongly the evils of the flooding of the basements of London houses with this sewage. The Council had no doubt done some excellent work, but this necessary sanitary work of London had been shelved too long, while more attractive schemes which appealed to the mass of the Council's critics were dealt with. It was only, he concluded, during the last three years that the London County Council had fully appreciated the great importance of this work.

Dr. Rideal proposed a vote of thanks to Mr. Fitzmaurice and Dr. Kenwood. He said that low-lying land was rapidly being built on which had been subject to this flooding in recent years, and that land, which would be made land, would be infected with organisms, and it ought to be regarded as an insanitary area. Therefore the delay of the County Council in regard to its drainage works had caused this remaining building land of London to be looked upon as suspect by sanitary reformers. The only remedy he could see for preventing the serious effects of floodings in basements was the adoption of some system of disinfection after the flooding. The greasy film which was left behind by the water was allowed to dry, and then it was blown about. Fortunately, this summer had been a cold summer, and there had been no hot suns to dry these deposits quickly, and people had had time to clean away much of the deposit that was left. The "dock-ising" of the Thames might modify the problem the County Council were dealing with. He confirmed all that had been said about the unsavoury character of the first storm flushings of London streets.

Mr. W. Kaye Parry seconded the vote of thanks, and referred to the legal aspect of the matter. He had come to the conclusion that the London citizen was long-suffering; and that the sort of thing that had been happening here would not have been so quietly borne in Ireland. In fact, in the north of Ireland a Sanitary Authority was brought into the courts for flooding the basements of some houses, the owners of which alleged that they had been injuriously affected by the sewers which the Authority had constructed. The case was dismissed on its merits, but the facts showed that there was a question as to how far authorities were liable for injury.

Dr. Butler, of Willesden, said he was medical officer of a district a large part of which drains into the metropolitan sewers, but a district which as yet was not represented on the L.C.C. Quite recently these floodings had become acute in connexion with underground bakehouses, and he had taken up the position that no bakehouse which was liable to floodings should be licensed, which, of course, was a hardship to the owners. He had seen 3 ft. of sewage in rooms in private houses, sewage in bakehouses mingling with the flour bags, beer barrels floating in cellars, and it had come to his knowledge that in the bar above sewage and not pure beer had been drawn. It was the quick, heavy rainfall which led to flooding, and frequently after the rain had ceased. He did not agree with Dr. Rideal as to disinfectants being a remedy. It was quite impossible for any disinfectant to reach all the nooks and crannies above and under the floors where the flood deposits were. In the portion of his district which was subject to flooding the death-rate was about twice that of the rest of the district.

Mr. C. H. Cooper, Wimbledon, exhibited a large diagram in order to show that floodings due to exceptional rainfall had been as great in other years. Remedial works ought not to be left off because of a remarkable rainfall this year. He thought steps ought to be taken to prevent low-lying lands being built on. A large amount of storm water could very well be discharged into the Thames on both sides of the river.

Mr. Dodd said he thought the Council were responsible for the present state of affairs, and he moved the following resolution:—"That this meeting is of opinion that the flooding of London basements with sewage is a great menace to the public health, and regrets that this menace has been allowed to continue for so many years, and it requests the Council of the Institute to urge upon the London County Council to proceed with all possible expedition with the completion of the necessary works upon the main sewers, and relieve London from its present insanitary state."

Mr. Loveday seconded, and Mr. Hodgson having spoken, the vote of thanks was put to the meeting, and carried.

Mr. Fitzmaurice and Dr. Kenwood having replied, the motion moved by Mr. Dodd was put and agreed to.

A vote of thanks to the Chairman concluded the meeting.

THE STUDENT'S COLUMN.—In consequence of the pressure on our columns our Student's Column article is held over until next week.

THE LONDON TOPOGRAPHICAL SOCIETY.—For want of space, our report of the meeting on Wednesday of the London Topographical Society is held over until next week.

ENGINEERING SOCIETIES.

INSTITUTE OF SANITARY ENGINEERS, LTD.—On Saturday last a meeting of the members of the Institute of Sanitary Engineers residing in Lancashire and the West Riding of Yorkshire was held at the School of Technology, Sackville-street, Manchester, with the object of forming a centre in that district. The chair was taken by Dr. J. B. Wilkinson (M.O.H., Oldham), Messrs. E. R. Palmer, N. W. Hoskins, and Arthur E. Ashby (Secretary) being present as a deputation from the London office. The Centre was declared duly formed for the purpose of furthering the interests of the members in that district, and it was unanimously agreed that the Centre would be beneficial to the objects of the Institute in raising the interests of the profession. Dr. J. B. Wilkinson was elected chairman, and Mr. H. L. Jaques (Manchester) Vice-Chairman for the ensuing year, who, together with the following members, will form the local committee:—Messrs. J. Ashton (Manchester), Honorary Local Secretary; G. V. Blaikie, Manchester; P. Leonard, Great Crosby; P. Mooney, Manchester; J. E. Entwistle, Bolton; F. Cartlidge, Leeds; C. R. Southwick, Sheffield; J. M. Lindsay, Manchester; and J. J. Quirk, Leeds.

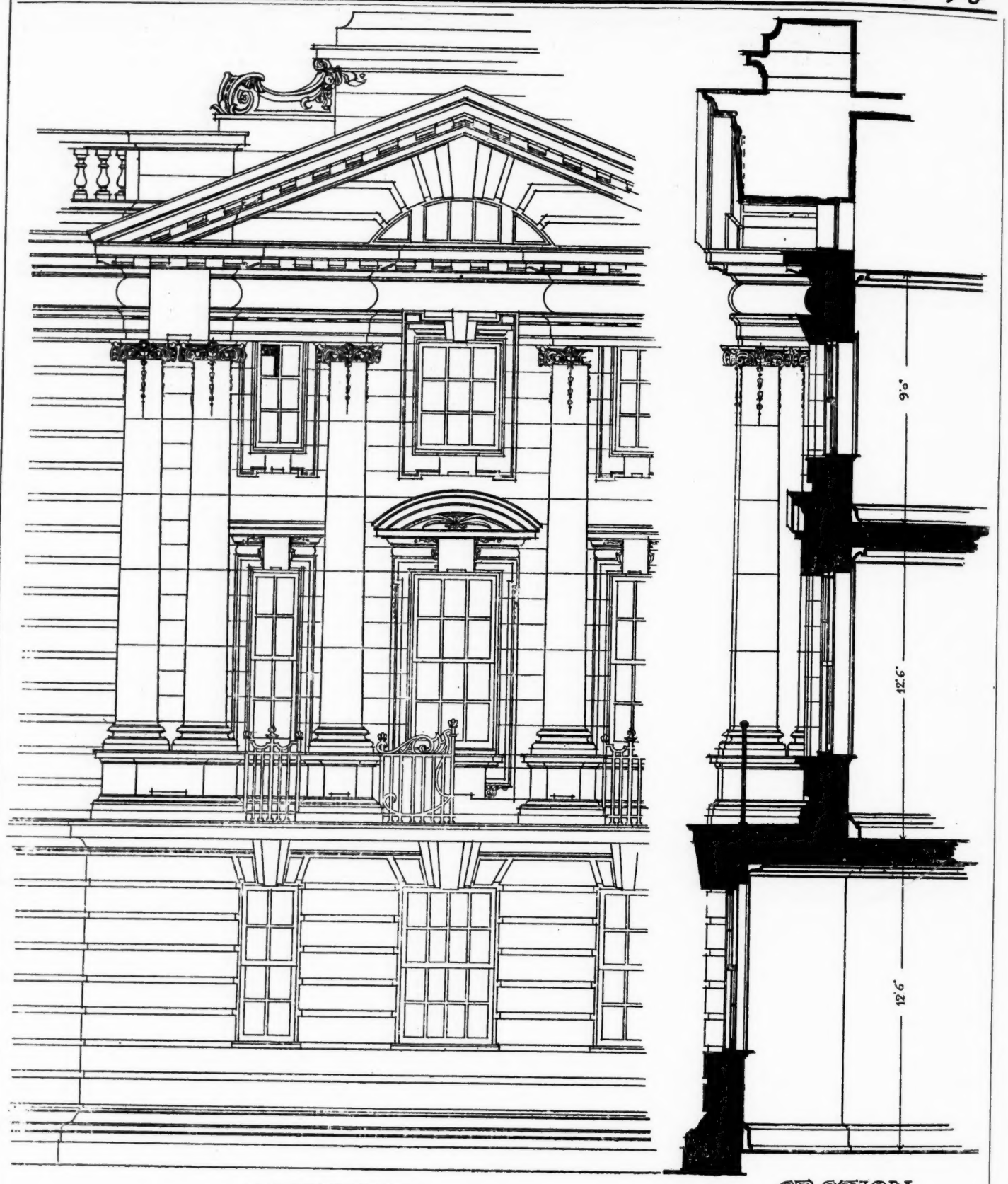
SOCIETY OF ENGINEERS.—The forty-ninth Annual General Meeting of the Society of Engineers was held on Monday, December 14, at the offices of the Society, 17, Victoria-street, Westminster. The chair was occupied by Mr. J. Patten Barber, President. The following gentlemen were duly elected by ballot, as the Council and Officers for 1904, viz.: As President, Mr. David Butler Butler; as Vice-Presidents, Messrs. Nicholas James West, Maurice Wilson, and Richard St. George Moore; as Ordinary Members of Council, Messrs. Joseph Bernays, George Austin Pryce Cuxson, George Abraham Goodwin, William Henry Holttum, Henry Sherley-Price, Edward John Silcock, Joseph William Wilson, and George Green; as Honorary Secretary and Treasurer, Mr. George Burt; as Honorary Auditor, Mr. Samuel Wood, F.C.A. The President announced that the following premiums had been awarded by the Council for papers read during the past Session, viz: The President's Gold Medal to Mr. Douglas Mackenzie for his paper on "Motor Transport for Goods"; the Bessemer Premium of Books to Mr. Robert J. Thomas for his paper on "Road Maintenance and Administration"; and a Society's Premium of Books to Mr. Albert Gay for his paper on "Mechanical Stokers for Electricity Generating Stations." A vote of thanks was accorded to the scrutineers, and the proceedings terminated by a vote of thanks to the President, Council, and officers for 1903, which was duly acknowledged.

COMPETITIONS.

BOARD SCHOOL, CLARKSFIELD, OLDHAM.—The design of Messrs. Cheers and Smith, architects, Blackburn, have been placed first in open competition for a new Board School, to accommodate 1,200 children, at Clarksfield, Oldham, and to cost 16,000*l.* The second place has been given to Messrs. Woodhouse and Willoughby, architects, Manchester.

FREE LIBRARY, TAMWORTH.—In this competition for a new free library, Tamworth, the design placed first was by Mr. E. R. Danford, A.R.I.B.A., architect, Northampton; the second premium was awarded to Messrs. Herbert T. Buckland and E. Haywood Farmer, architects, Birmingham; and the third premium to Messrs. Hodge and Haswell, architects, Teddington. There were 163 competitors, and the assessor was Mr. Jethro A. Cossins, architect, of Birmingham.

A NEW BOOK ON SILVER WORK.—Mr. Batsford has for some time had in preparation an important folio volume, entitled "Old Silver Work, chiefly English, from the Fifteenth to the Eighteenth Centuries," edited by Mr. Starkie Gardner, F.S.A., with 120 collotype plates, which he intended to issue to subscribers on the 12th instant. The edition was, however, so seriously damaged in the recent fire at Messrs. Leightons, the bookbinders, that he is obliged to defer the issue on account of the reprinting which has become necessary. The subscription price is five guineas, but by some curious error it was mentioned in several newspapers as fifty-four guineas.



ELEVATION SECTION

Stockport Town Hall Competition. Details of Firs. Premiated Design.

Illustrations.

DESIGN FOR STOCKPORT TOWN HALL.

WE give this week the perspective view and the two principal plans of the design by Mr. A. Brumwell Thomas, which has received the first premium in the competition for the proposed new Town Hall for Stockport. We also give a reproduction of the detail elevation and section.

We commented fully on the design in the article on the competition in our last week's issue.

NEW SCHOOLS FOR GILLINGHAM, KENT.

THIS design was placed first in the competition recently held for the buildings, the site of which is an exceedingly difficult one. The entrances are quite separate, the boys entering from Napier-road, and the girls and infants from Beresford-road, each department accommodating 300 children.

The buildings are proposed to be fireproof throughout, the roofs being formed of steel principals and purlins, slabs of uralite being placed between the purlins and covered with tiles on battens; the ceilings to be plastered on expanded metal lathing. The exterior is to be faced with stock bricks and red brick dressings, with salt-glazed dado to the playgrounds, and a similar dado to be run round the interior, including staircases and corridors. Mr. J. Hatchard Smith is the architect.

SKETCHES OF METAL WORK.

THE Montague Fordham Gallery, started some years ago by Mr. Montague Fordham for the exhibition and sale of the best examples of English handiwork, has recently taken over the workshops and personnel of the Artificers' Guild, an association formed by Mr. Nelson Dawson and Mr. Edward Spencer for the production of metalwork. The gallery is now showing an interesting collection of work designed by these artists, examples of which, from the drawings of Mr. Curtis Green, appear in our present issue, and we think that the designs we reproduce justify the hopes of the artists and craftsmen concerned that in the attempt to revive the spirit and tradition of mediæval handicraft a high standard of practical efficiency has been obtained.

A large proportion in our illustration of the designs are executed in forged steel with an armour bright finish, which provides an admirable contrast to the dull brass and toned bronze of the door furniture and smaller fittings.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, in the County Hall, Spring Gardens, S.W., Lord Monkswell, Chairman, presiding.

Loans.—On the recommendation of the Finance Committee, the following applications were agreed to: Battersea Borough Council 4,107*l.*, for contribution to street improvements; and 1,187*l.*, for purchase of land; Stepney Borough Council 3,030*l.*, for street improvement; and 600*l.*, for poor law purposes. Sanction was also given to St. Pancras Borough Council to a loan for 5,764*l.*, for street lighting purposes.

By-laws: Vehicular Traffic.—On the recommendation of the Local Government and Taxation Committee the following was agreed to:—

(*a*) That the by-law made by the Council on February 24, 1903, relative to vehicular traffic be repealed.

(*b*) That the following by-law for the good rule and government of the County of London be made by the Council in pursuance of the provisions of section 23 of the Municipal Corporations Act, 1882, and section 16 of the Local Government Act, 1888, and do come into force on May 1, 1904; that the seal of the Council be affixed to three copies of the by-law; and that, in accordance with statute, one copy be forwarded to the Secretary of State for the Home Department—

> "No owner of a vehicle shall drive such vehicle or permit the same to be driven or to be upon any highway unless it be so constructed that the driver thereof shall have a full and uninterrupted view of the traffic of such highway in front and abreast of him on each side, and no person who shall be driving any vehicle upon any highway shall occupy such a position as will prevent or interfere with his having such full and uninterrupted view as aforesaid.
>
> "Any person who shall offend against this by-law shall be liable for each offence to a penalty not exceeding forty shillings."

Main Drainage Extension.—The offer of Messrs. Glenfield and Kennedy, Ltd., to supply, deliver, and erect at the Crossness Outfall for the sum of 805*l.*, an additional penstock, 11 ft. 6 in. in diameter, as an extra upon their existing contract with the Council, was accepted.

Edwardes-square.—On the recommendation of the Parliamentary Committee the Edwardes-square Protection Bill was approved.

Long Grove Asylum: Diversion of Watercourses.—It was agreed, on the recommendation of the Asylums Committee, that the Council give up to the Epsom Urban District Council a strip of land forming part of the Horton Estate on the north-western side of Horton-lane, for the purpose of widening Horton-lane, conditionally on Epsom Urban District Council agreeing to the diversion of certain watercourses on the estate.

Clapham Car-Shed.—On the recommendation of the Highways Committee, it was agreed that, should Messrs. Kirk and Randall complete the erection of the second portion of the Clapham car-shed before the date, November 5, 1904, named in their contract with the Council, they be paid a bonus, at the rate of 30*l.* a week, in respect of the time between the date of completion and that specified in the contract.

Improvements.—On the recommendation of the Improvements Committee, it was agreed:—

That the estimate of 1,483*l.* submitted by the Finance Committee be approved; that the Council's statutory consent be given to the widening of Upper Richmond-road, proposed to be undertaken by the Council of the Metropolitan Borough of Wandsworth; and that a contribution be made on the usual conditions of one-third of the net cost of the improvement, provided that should the total net cost exceed 4,450*l.*, the Council's contribution will be limited to 1,483*l.*

That the offer of the Council of the Metropolitan Borough of Battersea to undertake, at an estimated cost of about 2,920*l.*, the paving and other works connected with the widening of Battersea-rise, authorised by the London County Council (Improvements) Act, 1900, be accepted.

Amendment of the London Building Act.—On the motion of Mr. Johnson, seconded by Mr. Wilberforce, it was agreed that it be referred to the Building Act Committee to consider, in connexion with the proposed amendments of the London Building Act, the desirability of providing for further control over the erection of cranes which, when at work, may overhang a public thoroughfare.

The Council then adjourned.

APPLICATIONS UNDER THE 1894 BUILDING ACT.

THE London County Council at their meeting on Tuesday dealt with the following applications under the London Building Act, 1894. The names of applicants are given between parentheses:—

Hackney, North.—A one-story addition at the rear of No. 150, Tottenham-road, Dalston, with external walls at less than the prescribed distance from the centre of the roadway of Culford-mews (Mr. G. Chamberlain).—Consent.

Lewisham.—The conversion of part of the dwelling-house, No. 54, Laleham-road, into a shop (Mr. D. E. Alflatt).—Refused.

Lines of Frontage and Projections.

Kensington, North.—An iron and glass covered way in front of No. 13, Pembridge-crescent, Kensington (Messrs. Davis and Emanuel for Mr. I. Davis).—Consent.

Lambeth, North.—A two-story addition over the existing one-story building at No. 20A, Old Paradise-street, Lambeth (Mr. A. E. Symes for Mr. J. Reed).—Consent.

Chelsea.—Retention of a wooden oriel window on the ground floor level of No. 31, Sydney-street, Chelsea (Mr. S. H. Egan for Mr. A. P. King).—Consent.

Hackney, Central.—One-story shops upon the forecourts of Nos. 530, 532, and 532A, Kingsland-road, Hackney (Mr. A. K. Stephens for Mr. C. Housden).—Consent.

Hampstead.—An iron and glass washing shed at No. 43, Frognal, Hampstead (Mr. A. Conder for Mr. R. W. Wilkinson).—Consent.

Hampstead.—A motor-house at the rear of No. 160, Fordwych-road, to abut upon Ronduroad, Hampstead (Messrs. Done, Hunter, and Co. for Mr. W. Jones).—Consent.

Lewisham.—Wood and tile pents over the entrances to seventeen houses on the north-east side of Longhurst-road, Lee (Mr. A. Marsh).—Consent.

Marylebone, East.—Four three-story oriel windows in front of buildings on the western side of Albert-road, Regent's-park, at the corner of High-street, St. Marylebone, on the site of Portland-terrace (Mr. F. M. Elgood for Mr. J. A. Michell).—Consent.

Strand.—Retention of an iron and glass illuminated sign over the entrance to Kissel's Tivoli restaurant, Strand (Mr. F. Kissel).—Consent.

Islington, East.—That the Council do make no order upon the application dated November 24 of Mr. F. J. Garlick on behalf of Messrs. C. W. Matthews and A. E. Bailey for permission to retain four bay-windows at the rear of a block of residential flats on the site of No. 14, Highbury-crescent, Highbury-fields, Islington.—Agreed.

Bethnal Green, North-east.—A one-story shop upon the forecourt of No. 394, Hackney-road, Bethnal Green (Mr. A. H. Henderson for Mr. H. Warden).—Refused.

Hackney, South.—A building, with bay-windows and a one-story shop, to abut upon the west side of Chatsworth-road and north side of Elderfield-road, Clapton (Mr. G. Billings for Mr. R. R. Sidnell).—Refused.

Strand.—A building at Nos. 27 to 33, Charing Cross-road, Strand, with a projecting shop front (Messrs. Wimperis and Best for Mr. J. B. Wells).—Refused.

Hackney, Central.†—A one-story show-room addition upon the existing one-story shops at Town Hall-buildings, Mare-street, Hackney, abutting upon The Grove (Mr. J. Hamilton for the Hackney Furnishing Co., Ltd.).—Refused.

Islington, North.†—A motor-car building at No. 56, Crouch-hill, Islington, to abut upon Blythwood-road (Messrs. Dove Brothers for Mr. F. L. Dove).—Refused.

Width of Way.

St. Pancras, North.—Permission to retain forecourt walls on the eastern and southern sides of Greenwood-place, Highgate-road, St. Pancras, at less than the prescribed distance from the centre of the roadway (Mr. J. P. Crosby for Messrs. Maple and Co., Ltd.).—Consent.

Limehouse.—A workshop upon the site of No. 1, Nightingale-lane, Limehouse, with external walls at less than the prescribed distance from the centre of the roadway of the street (Messrs. Watts, Johnson, and Co. for Mr. C. Morrow).—Consent.

Wandsworth.—The formation of an entrance in the iron fence on the west side of Churchlane, Tooting (Messrs. A. and C. Harston for the Metropolitan Asylums Board).—Consent.

Limehouse.—Two water-closets on the forecourt of the Meeting House, Brook-street, Ratcliff (Mr. R. Saunders for the Society of Friends).—Refused.

Peckham.†—Permission to retain the forecourt fences in front of four houses on the east side of Albert-road, Peckham, at less than the prescribed distance from the centre of the roadway of the street (Mr. G. E. Hubble).—Refused.

Width of Way and Line of Frontage.

Limehouse.†—A one-story building in the playground of Dr. Barnardo's Home, on the east side of Bower-street, Stepney (Mr. R. H. Hill).—Refused.

Width of Way and Construction.

Poplar.†—A wood and iron building at Union Wharf, on the south side of Orchard-place, Poplar (Mr. J. Richardson).—Refused.

Space at Rear.

Hackney, North.†—A modification of the provisions of section 41 of the Act, with regard to open spaces about buildings, so far as relates to the proposed erection of Nos. 11, 13, 15, and 17, Alcester-crescent, Mount Pleasant-lane, Hackney, with irregular open spaces at the rear (Mr. J. Hamilton for Mr. W. W. Hayworth).—Consent.

Chelsea.—A modification of the provisions of section 41 of the Act, with regard to open spaces about buildings, so far as relates to the proposed erection of buildings on a site abutting upon the north-west side of Basil-street and east side of New-street, Chelsea (Mr. R. Bennett).—Refused.

Line of Frontage and Space at Rear.

Battersea.—A deviation from the plans approved on the 3rd day of November, for the erection of three buildings on a site on the north-west side of Battersea Park-road and south side of Home-road, Battersea, so far as relates to an increase in the height of the westernmost building (Mr. E. Cannell for Mr. F. Priddis).—Refused.

Deviation from Certified Plans.

Westminster.—A deviation from the plans approved on the 7th day of November, 1899, under section 43 of the Act, for the rebuilding of the "Feathers" public-house on the site of Nos. 32 and 33, Great Chapel-street, Westminster, so far as relates to an extension over the roof of such building of a portion of Queen Anne's-chambers adjoining (Messrs. Rolfe and Matthews).—Consent.

Whitechapel.—Deviations from the plans certified by the District Surveyor under section 43 of the Act, so far as relates to the proposed rebuilding of the "Archers" public-house, No. 24, Osborne-street, Whitechapel, at the corner of Old Montague-street (Mr. J. D. Scott for Mr. J. A. Goddard).—Consent.

Means of Escape at Top of High Buildings, and Projections.

Strand.—Means of escape in case of fire proposed to be provided in pursuance of section 63 of the Act, on the fifth story of No. 7, Golden-square, Strand (Mr. L. V. Hunt for Messrs. J. B. Ellison and Sons, Ltd.).—Consent.

Strand.—A projecting balcony in front of Nos. 6 and 7, Golden-square, Strand (Mr. L. V. Hunt for Messrs. J. B. Ellison and Sons, Ltd.).—Consent.

Cubical Extent and Construction.

Woolwich.—An addition to a "gutta-percha covering" shop at the works of Messrs. Siemens, Brothers, and Co., Ltd., Harden's-Manorway, Plumstead (Messrs. Siemens, Brothers, and Co., Ltd.).—Refused.

Dwelling-houses on Low-lying Land.

Greenwich.—Three dwelling-houses on low-lying land situated on the north side of Trafalgar-road, Greenwich (Mr. E. Mills).—Consent.

Rotherhithe.—Six dwelling-houses on low-lying land, situated on the east side of Bush-road, Lower Deptford-road, Rotherhithe (Mr. J. H. Bethell).—Consent.

The recommendations marked † are contrary to the views of the local authorities.

METROPOLITAN ASYLUMS BOARD.

THE usual fortnightly meeting of this Board was held at the offices, Victoria Embankment, on Saturday last.

Among the correspondence received was an order from the Local Government Board authorising the execution of alterations and additions at the Fountain Hospital at a cost of 15,000*l.*

The General Purposes Committee reported that a settlement had been arrived at in the case of the Managers *v.* Harmsworth Bros., which was an action for an injunction and damages against the proprietors of the *Daily Mail* in respect of nuisance caused by the noise and vibration of their machinery. The settlement arrived at was that the defendants shall keep closed at all times the two sets of iron doors in the basement internal wall of their premises, known as Harmsworth Buildings; the defendants to put and keep in repair the felt with which they have covered the said wall dividing the premises; the defendants to keep shut down and refrain from working the said dynamo and print-

ing presses between the hours of 7 a.m. and 7 p.m. every day henceforth, and the defendants to keep closed the windows next to the plaintiffs' premises in the stereotyping-room of the defendants' premises. The defendants to pay the plaintiffs' cost of action as between solicitor and client, which are agreed at 52*l.* 10s. The Board consented to and confirmed this agreement.

South Eastern Hospital.—The Hospitals Committee reported that, pursuant to reference of November 11 last, they had had before them the Local Government Board's letter of November 10, in which that authority asked to be informed of the result of the Managers' consideration of the matters referred to at the recent interview between the Chairman of the Hospital Committee, the Managers' architect, the Board's inspector, Dr. Downes, and their architect, and to be furnished with copies of the amended plans. They had informed the Local Government Board, in reply, that the proposed position of the mortuary had been altered so as to avoid its being within 40 ft. of the public roadway, and that the main entrance would be placed in the centre of the road frontage opposite the administrative block instead of on one side, and copies of the plans as amended had been forwarded. According to a report submitted by the Works Committee it appeared that the sum of 13,689*l.* had been expended during the year 1903 on the painting and cleaning of infectious hospitals. The works carried out by direct labour had involved an expenditure of 9,750*l.*, while those carried out by contract had amounted to only 3,939*l.*

North Eastern Hospital.—The same committee reported that Messrs. P. H. Allin and Sons, whose tender for certain alterations and additions to the hot-water apparatus of this hospital were accepted recently, having declined to carry out the work unless allowed an additional payment of 500*l.* and an extension of the contract, the committee had advertised for fresh tenders. The amounts will be found among this week's "Tenders."

Tooting Bec Asylum.—The Committee were empowered to advertise for tenders for the execution of certain additional surface water drainage at the Tooting Bec Asylum, in accordance with the plan prepared by the architects, Messrs. A. and C. Harston, whose estimate is 490*l.*

Leavesden Asylum.—On the recommendation of the Asylums Committee, authority was given for cleaning the internal walls and distemepering the ceilings of this asylum at an estimated cost of 307*l.*

A report was brought up by the Children's Committee dealing with a proposal to purchase a property at Hayes for the accommodation of feeble-minded girls over school age. The consideration of the report was adjourned.

St. Anne's Seaside Home.—The Children's Committee reported also that they had considered a report made by Mr. A. B. Lowry, and forwarded to them by the Local Government Board. Mr. Lowry, in the course of his report, said:—"There is a large dormitory on the first floor from which there is not sufficient means of escape in case of a fire blocking access to the wooden back staircase," and he suggested that a staircase should be provided from the roof of a day-room to the ground, so that in case of a fire breaking out in this part of the building, the children "could get through an attendant's bedroom and out of the window, therefrom on to the roof of a dayroom," and so, by the staircase to the ground. The Committee considered that it would be much better to form a doorway at the end of the dormitory in question at the side of the fireplace and provide an iron staircase from this doorway to the ground. They recommended, therefore, that the proposal to form a door at the end of dormitory No. 17, and to provide an iron outside staircase from this doorway to the ground, be approved, subject to the sanction of the Local Government Board to the structural alteration, and that the Works Committee be authorised to carry out the work.

This was agreed to.

COURT OF COMMON COUNCIL.

The usual fortnightly Court of Common Council was held in the Guildhall, E.C., on Thursday last week.

The Improvements and Finance Committee submitted a report dealing with several street improvement schemes. Among them was a proposal to construct a new street from Giltspur-street to King Edward-street, across the site of Christ's Hospital, and also to widen the latter street. It was agreed to accept the offer of Christ's Hospital to sell the necessary land for 45,000*l.*

The Streets Committee reported on a letter read from the London County Council, asking the views of the Corporation on an application by Mr. Howard Chatfeild Clarke, on behalf of the Indemnity Mutual Union Assurance Company for consent to the erection of a projecting balcony over the entrance to No. 1, Old Broad-street. It was stated that the London County Council had refused the application before the committee had had an opportunity of considering the matter, and it was agreed to request the London County Council to withhold its decisions on such matters until it was in the possession of the view of the Corporation. It was agreed that the sum of 2,214*l.* be offered for the ground required to widen the public way in front of No. 71, Fleet-street.

The question of Municipal Fire Insurance, which was down on the agenda for discussion, was, on the motion of Mr. Horncastle, adjourned.

ROYAL COMMISSION ON LONDON LOCOMOTION.

At a sitting of this commission, held on Thursday last week, under the chairmanship of Sir D. Barbour, evidence was given by Mr. F. R. Whirr, Chairman of the Works Committee of the Paddington Borough Council, who referred to the evils caused by the constant breaking up of the roads, as the effect was to ruin the surface of the roadway, particularly in the cases of flint, gravel, and macadamised carriageways. He thought companies should be prohibited from breaking up the roads during December, January, and February, except in cases of great urgency. The Borough Councils should have entire control over the roads and streets in their districts so far as maintenance and upkeep were concerned. He opposed any power being given to the Central Authority to authorise breaking up of streets. He advocated the extension of underground railways and shallow tramways on a comprehensive plan. When roads were widened for tramway purposes the whole cost of the widening should be borne by the tramway authority. Powers should be given to the Borough Councils enabling them to construct in the subsoil under the footways and carriage-ways, short subways for pedestrians, and such subways would enable the refuges to be removed.

Mr. W. N. Blair, Borough Engineer and Surveyor of St. Pancras, gave evidence at considerable length with regard to the congestion in Hampstead-road, Tottenham Court-road, Gray's Inn-road, and Euston-road. The London County Council at present had power to widen Hampstead-road but refused to carry it out unless the Borough Council gave consent to the extension of a tramway down the Tottenham Court-road. Just recently the Borough Council had agreed to the tramway down Tottenham Court-road on condition that the London County Council widened the street. With regard to Euston-road this was laid out about 1827, under an Act of George IV., and was known as "the new road leading from Edgeware-road, near Paddington, to the Great Northern-road, in Islington." It was laid out with a total width of 60 ft., and it was originally provided that no building should be erected on any new foundation within 50 ft. of the sides of the road. Subsequent legislation removed this restriction, and it is now within the power of the London County Council to sanction a building out to the line of the street, and many have been so erected. He suggested that without further delay there should be adopted some definite policy to secure the widening of Euston-road, either one side only or on both sides. He believed that to widen 10 ft. of each side, and to permit the reconstruction of buildings to an advanced line, not necessarily the line of street, but even 15 ft. back from that, could be carried out from Gower-street to King's-cross practically without cost to the public except in the actual alteration of the pavements, as the owners of the land have in several instances indicated a willingness to give up strips of land to widen the road if they were permitted to advance the line of buildings. To continue the same widening between Gower-street and Portland-road Station would be a more costly undertaking for the reason that buildings already exist throughout almost the entire length up to the line of street, but in his opinion the widening was equally necessary, and the longer it was delayed the greater would be the cost.

Mr. W. C. Leete, Town Clerk of Kensington, gave evidence for that Council, and strongly supported the appointment of a Tribunal for the consideration of railway and tramway schemes. They appreciated the desirability in the carrying out of very great street improvements or the foundation of any new main thoroughfare, of the construction of a subway being regarded as an essential feature of the scheme.

The following day, evidence was given by Mr. H. C. Jones, Town Clerk of Holborn, who favoured the construction of underground tramways as against surface tramways. He would like to see subways for foot passengers constructed at busy points. It was high time that Parliament imposed certain restrictions upon the breaking up of public ways. He saw no reason why Borough Councils should not be allowed to make subways without going to Parliament for powers. He considered that where there was a double line of tramway the street should be 100 ft. wide.

Mr. H. C. J. Edwards, Borough Engineer of Lambeth, said it had been considered that the Central Authority, acting as the Street Authority, might bring about the much-spoken-of scheme of utilising for general purposes one material, rather than the variety of materials which now form the surface of carriage-ways throughout London. In this matter again different local authorities are not affected in one and the same manner; that is to say, what may be required in certain parts, the East End, where enormously heavy traffic has to pass over, would not be satisfactory in the West End of London; and again, in the residential quarters of the West End a material is required different from that in many other districts, owing to its more residential character; for instance, in Kensington and that district, the soft wood-paving brings that quiet to the resident which is so very necessary in such a quarter, and although it may be costly and the life not be so long as hardwood, yet, if the circumstances require, it is well that the local authorities should judge for themselves what best suits the purpose. In Lambeth hardwood paving has become the fashion ever since hardwood first came into use (the first piece having been laid in Lambeth in Westminster Bridge-road, in 1889). In the East End of London, granite pitched cubes, known as granite pitching paving, is the more common material, as necessitating a less frequent interference with the roads, and consequently longer periods of freedom of obstruction to traffic. Again, there are roads where tramways exist, and others where tramways do not exist, and the same conditions do not apply with regard to the carriageway paving. Asphalt paving may be laid, as in the City, where no tramways exist; and no more sanitary paving, all would agree, could be provided. But asphalt could not be laid alongside tram-rails, except at a very considerable risk indeed; in fact, he considered that no Surveyor in London would venture to recommend its use for that purpose where tramways exist; so that whilst one might consider that asphalt was the best material, the general feeling is in favour of hardwood paving. The Local Authority, and not the County Council, have to bear the cost of the repair and maintenance of the roads and streets within their area, and no Central Authority should, therefore, decide the material to be used, and the mode in which it should be used. The difficulties more particularly experienced in connexion with traffic might perhaps be very much overcome, or at all events be largely remedied, by judicious street widenings and improvements, especially at points near the bridges, where constant streams coming from and going to what might be called the "throat" of a bridge road must of necessity congest the traffic very considerably. To be able to discharge crowded traffic to a bridge freely from either side would be a great boon. He spoke, of course, from experience in his own district, where such improvements would be very beneficial indeed, having regard to the terminus of tramways.

Mr. Higgens, Borough Surveyor of Chelsea, considered there was need for more tube railways to pass through Chelsea. He alluded to the grievance felt in Chelsea at the action of the London County Council in refusing to contribute to the cost of widening King's-road without they had a tramway. Such a tramway in King's-road would lead to further congestion. They would not object to leaving the decision as to who should bear the cost of widening such a thoroughfare to an independent tribunal.

WESTMINSTER CITY COUNCIL.

The usual fortnightly meeting of this Council was held at the City Hall, Charing Cross-road, on Thursday last week.

On the recommendation of the General Purposes Committee it was agreed to appoint the Mayor, Alderman T. W. L. Emden, a member of the Metropolitan Water Board in the place of Lieutenant-Colonel Probyn, resigned.

The same committee reported the receipt of a letter from the Clerk to the London County Council stating that that Council was desirous of compiling a register of historic buildings in the parishes in which the new streets Aldwych and Kingsway, and the streets affected by the Westminster improvement are situated, and asking for the co-operation of the Council in the matter. The committee recommended that the London County Council be informed that the City Council were willing to co-operate with them in the matter as far as possible. Councillors Tozer and Walder and the Town Clerk were appointed representatives of the Council on the proposed Association of Metropolitan Borough Councils, on the recommendation of the same committee. It was reported that the Bayswater-road Burial-ground had been

put into good order in accordance with a recommendation passed by the Council in July last.

The Law and Parliamentary Committee brought up a long report dealing with Bills in Parliament during the last Session, compiled by the City Solicitors and Parliamentary Agents. It appeared from the report that out of eighty-two miles of new tube line projected, four miles only were authorised, and of these about one mile only was in the City of Westminster. Referring to the Charing-cross and Hampstead Railway Bill, which had passed and become law, the report stated that the part of the Bill which concerned Westminster was the clause which gave the company power "to enter upon, take, and use for the purposes of their undertaking certain lands" in the Parish of St. Martin-in-the-Fields, in the City of Westminster. Part of those lands was the eastern portion of the station yard or forecourt of the Charing-cross Station of the South Eastern Railway Company. The South Eastern Company's Act of 1859, under which Charing-cross Station was built, provided expressly that the forecourt should be "maintained forever as an open space." The railway company had often attempted to obtain the repeal of this clause, which was a most important one in the interests of the traffic in the adjoining street. The reason for the tube railway company desiring to acquire the ground was not clear. Even if no superstructure were intended, a station under the forecourt discharging its traffic into that already congested area would be most objectionable. When the Bill came before the Committee of the House of Commons, the Council's case was heard, and the chairman of the promoting company admitted that he would have liked to have used the existing kiosque in the forecourt as an entrance to an underground station. Ultimately a clause was inserted protecting the forecourt of the station, and as amended the Bill became law. The Works, Sewers, and Highways Committee submitted a scheme for providing work for the unemployed of Westminster. It was suggested that the clinker formed by the destruction of refuse at the Shot Tower Wharf should be used in the making of slabs for paving. The report was received.

The same committee reported on a letter received from H.M. Office of Works, with regard to a subway from the Imperial Institute to the New Royal College of Science, which letter complained and objected to certain restrictions of the City Council. The committee recommended and it was agreed that the Office of Works be informed that the Council had rights beneath the streets for the construction of sewers; that the subsoil was vested in the Council for other purposes, and that as owners of the soil of the street, they could not see their way to depart from their previous decision.

BOOKS RECEIVED.

MOOT POINTS: FRIENDLY DISPUTES UPON ART AND INDUSTRY. Between Walter Crane and Lewis F. Day. (B. T. Batsford. 1s.)

THE LAW OF COMPENSATION. By J. H. Balfour Browne, K.C., and Charles E. Allan, M.A. Second Edition. (Butterworth and Co., and Shaw and Sons.)

Correspondence.

BRIGHTON AND HOVE HOSPITAL FOR WOMEN.

SIR,—I regret that you are still in error with regard to the omission of accommodation.

The schedule begins, "House surgeon—sitting-room, bedroom." These rooms were provided in a self-contained suite on the first floor. Further on, "Staff dining-room and staff sitting-room" were asked for. As no other rooms of this character were mentioned, it is clear that they were intended to be used by the nurses. In the hurry of finishing the drawings the word "nurse" was used instead of the word "staff," which no doubt partly explains your mistake.

In the Answers to Questions, it is stated that the house surgeon and porter would be the only male residents, that no room for the visiting medical was required, and that competitors were confined to the schedule of accommodation given.

E. P. HOWARD.

*** We regret that we should have done Mr. Howard any injustice; but we may observe that, the drawings not being on view till Wednesday last week, the time for examining them was necessarily very short.—ED.

NEW HALL, CARDIFF UNIVERSITY SETTLEMENT.—The Committee of the Settlement have now chosen as their architect, for the erection of a new hall, Mr. R. W. Schultz.

OBITUARY.

MR. CHARLES FOWLER.—We regret to have to record the death of Mr. Charles Fowler, F.R.I.B.A., who passed away on the 8th inst., at his residence, Abbotsleigh, Farnborough, aged eighty years. Some of our older readers will remember Mr. Fowler's father, who designed Hungerford and Covent Garden Markets. Mr. Fowler was a most accomplished architect, and but for his many appointments would have left behind more architectural works. He joined the Institute in 1857, and was elected a Fellow and life member in 1862, serving at different times on the Council. He was elected District Surveyor of St. Giles and Bloomsbury in 1854, and was succeeded in 1871 by Mr. C. Foster Hayward. He was District Surveyor of Shoreditch (succeeding the late Mr. Robert Warton) from 1871 to 1892, in which latter year he resigned, and was succeeded by Mr. Henry Lovegrove, who had before had South Islington only. He was for some years Honorary Secretary to the District Surveyors' Association, and in due course became president. On the death of Mr. Henry Baker he was appointed surveyor to the Portland Estate, which post he resigned a few years since.

MR. GWYTHER.—We regret to announce the death, on December 10, at his residence, 9, Clifton-hill, N.W., in his seventy-fourth year, of Mr. William Warlow Gwyther, of No. 26, Bedford-row, W.C., architect and surveyor. Mr. Gwyther had been a Fellow of the Surveyors' Institute, and was elected a Fellow of the Royal Institute of British Architects in 1880. Of his principal architectural works we have illustrated in our columns the London branch of the Bank of Scotland, erected by Messrs. Colls and Sons, as general contractors, on the site of Crosby Hall-chambers, Bishopsgate Within, and the new head-offices for the Yorkshire Banking Company, at the corner of Boar-lane and Bishopsgate-street, Leeds. The large copper dome is 40 ft. in diameter and the circular façade presents a single order of attached fluted and polished Corinthian columns, 3 ft. in diameter and 30 ft. high, of Ross o' Mull granite resting upon a massive sur-base of polished grey Aberdeen granite (November 25, 1899, photographs of the exterior and interior). His design for the London branch, in Birchin-lane, E.C., of the Commercial Banking Company of Sydney, includes a classical elevation of polished granite and Portland stone, with Ionic pilasters. Mr. Gwyther was the architect also of No. 61, Kensington-court, S.W.; the branch offices in Silver-street, Hull, of the Yorkshire Banking Company; the Bayswater-road branch, at No. 1, Marlborough-gate, W., of the National Provincial Bank of England; of that same bank's new premises at No. 155, Mare-street, Hackney; and, we believe, of their branch offices in Ramsgate. For the City (now the London, City and Midland) Bank he prepared the plans and designs for their new buildings in Old Bond-street (west side); in Balham High-road (on the site of No. 285); on the site of No. 19, High-street, Marylebone; and on the site of No. 1, Leonard-place, Kensington High-road, all erected during the interval 1897-1903.

GENERAL BUILDING NEWS.

CHURCH, ILFRACOMBE.—The new St. Peter's Church, erected in the place of the old iron one in Highfield-road, Ilfracombe, was opened and consecrated on the 10th inst. The church is a chapel-of-ease to the Parish Church, and has been built to relieve the overcrowding in Holy Trinity. The church is not by any means completed, it being impossible to proceed with the chapel, clergy vestry, west porch entrance, and tower owing to the want of funds. The portion completed consists of the sanctuary, chancel, choir vestry, organ chamber, nave, north and south aisle, and north and south transept base of the tower, and the heating chamber. So far about 6,500*l.* has been spent. To entirely complete the church—that is, to finish the tower, chapel, vestries, and west porch—another 1,500*l.* will be required, making a total of 8,000*l.* for a building which, in case of need, would accommodate over 750 persons. The design of the church, prepared by Mr. Fellowes Prynne, is Late Decorative in style. The plan consists of a nave 85 ft. long by 28 ft. wide, across the church to the transept 59 ft., and across the aisles 19 ft. The chancel and sanctuary are 34 ft. long and 21 ft. 6 in. wide, a passage for returning communicants being placed on each side. The arcade arches in the nave are 19 ft. high, and the walls 24 ft. The height from floor to ridge is 42 ft. The roofs throughout are of waggon construction and stained with a brown oak colour, being decorated with a spiral rope pattern of the fourteenth century style, with moulded principals and cornices. The new church is entirely built of stone throughout, pink limestone outside, and with Cosham stone quoins from Ipplepen, near Newton Abbot, also a red sandstone as a dado, with a grey stone above, from Combemartin and Barnstaple-road quarry. The spinal fluted columns, supporting the arcade arches, are of solid Cosham stone and slate dowelled together.

NEW R. C. CHURCH, MUSSELBURGH.—The Roman Catholic church and priests' house for Musselburgh is now being erected. The design is by Mr. Archibald Macpherson, architect, Edinburgh. There will be accommodation for 500 worshippers.

Y.M.C.A. PREMISES, BALLYMONEY, IRELAND.—The new premises of the Young Men's Christian Association in Church-street, Ballymoney, were opened on the 7th inst. The premises, which occupy a site in Church-street, have a frontage of 36 ft., and extend back for a distance of 245 ft. They comprise reading-room, parlour, classroom, large recreation-room, and dark-room for photography. The architect was Mr. James A. Hanna, C.E., Belfast, and the contractor Mr. John Henry, Ballymoney.

SANATORIUM, BRIDGE OF ALLAN.—A new non-consumptive sanatorium is to be erected at Bridge of Allan from plans prepared by Mr. Charles G. Soutar, architect, Dundee. The principal contractors are as follows:—Mason work, Mr. T. S. Dick, Broughty Ferry; joiner work, Messrs. J. and W. Guthrie, Dunblane; plumber work, MacLeish, Morrison, and Co., Ltd., Perth: roofing tile work, Messrs. Brand and Son, Arbroath; plaster work, Mr. William Peebles, Perth; and glazier work, Mr. W. G. Crichton, Stirling.

COUNTY COURT OFFICES, CARDIFF.—The new Government buildings which are to be erected adjoining the Post-office in Westgate-street, Cardiff, are to provide accommodation for the Registrar of the County Court, the District Registry of the High Court of Justice, the High Bailiff, and the Inland Revenue Department. The material to be used for the front of the building will be similar to that of the Post-office. The basement will contain rooms for the storage of papers, strong-rooms, and a retiring-room for clerks, while the High Bailiff's offices are situated at the rear of the building. The whole of the ground floor will be occupied by the County Court, Bankruptcy Department, the District Registry, and High Court offices. In front of the buildings is a large plaint office, which can be used by the public in connexion with the offices of the County Court, and which is about 48 ft. wide by the same depth. This office contains strong-rooms for the storage of books and papers in daily use. Leading out of the last-named department is the chief clerk's room, the Registrar's office being at the rear, where there are also provided the Bankruptcy offices and the offices of the High Court, together with a waiting-room for solicitors, witnesses, and the public attending upon the Registrar. The District Registry and Bankruptcy offices are approached by a large corridor 11 ft. wide by about 100 ft. long. On the first floor offices are provided for the surveyors, assistant-surveyors, and collectors of Customs for the Inland Revenue, for the Excise officers, and for the clerks employed in those departments. On the third floor there will be further accommodation for the Inland Revenue department, together with necessary rooms for a permanent caretaker. Altogether the building will contain about fifty rooms, besides lavatories and offices. —*Western Mail.*

SALVATION ARMY CITADEL, MASBOROUGH.—On the site of some old cottages situate at the upper end of Park-street, Councillor Cartledge has caused to be erected a hall for the Salvation Army, to accommodate some 340 persons. Messrs. E. Hutchinson and Son, of Rotherham, have been the architects, and Mr. G. Saul, of Kimberworth, the contractor.

HOTEL, HARROW.—The Royal Brewery Co., of Brentford, have just completed an hotel, to be known as the "Rising Sun," at Greenford-road, Harrow. The building has been erected at a cost of 6,000*l.*, from the plans of Messrs. Nowell Parr, and A. E. Kates, architects, of Brentford.

CHURCH SCHOOLS, PUTTENHAM, SURREY.—Puttenham New Church Schools, of which the foundation-stone was laid on June 18 of this year, have been erected to the plans of Mr. A. J. Stedman, architect, of Farnham, by Messrs. Heal and Jackson, of Compton. The new building provides accommodation for 120 children as a mixed school.

AN OLD WORCESTERSHIRE HOUSE.—The tender of Mr. A. Cliff, of Evesham, has been accepted for additions and alterations to The Den, Cropthorne, a charming country house which was originally a group of black and white cottages, of the type of which so many yet remain in the county of Worcester, and which were made into one house for a late eminent surgeon. Since passing into the hands of its present owner, further improvements have been made to the property under the direction of Mr. E. Lutyens and Mr. Drinkwater Butt, the former adding a quaint sunk garden and sundial, and the latter restoring the proper leaded

lights to the windows, and being now responsible for the new gables, etc. In the whole of the design, the greatest care has been taken to prserve the old work, and to make the new in harmony with it.

ROYAL MILITARY COLLEGE, SANDHURST.—In order to meet the increased requirements involved by the recommendations of the Special Committee upon Military Education, the War Office have resolved to expend a sum of from 300,000*l.* to 350,000*l.* upon an extensive enlargement, with improvements, of the Royal Military College at Sandhurst. The College was opened there in 1812, in place of the former institution at Great Marlow. The main building, which has a Doric octastyle portico, is 430 ft. long, the whole façade extending over about 900 ft. The new buildings will afford room for 300 cadets in addition to the 300 who are now accommodated, and will comprise a new wing, and a block, at the rear, of officers' quarters. The present suites of married men's quarters in the basement will be rearranged as bath-rooms, offices, and so on.

PUBLIC BATHS FOR STOKE NEWINGTON.—On Tuesday night, Stoke Newington Borough Council considered a scheme to provide public baths, which would include first and second-class swimming baths, 100 ft. by 40 ft. and 80 ft. by 30 ft. respectively, 68 slipper and spray baths, with the usual waiting-rooms, offices, etc., and an establishment laundry. The scheme was adopted with modifications, and was referred to a committee to make the necessary preliminary arrangements.

BRANCH PUBLIC LIBRARY, HOLBECK (LEEDS).—The new branch library at Holbeck, which occupies a site at the corner of Nineveh-road and Marshall-street, has been erected under the superintendence of the architect, Mr. William Bakewell, of Leeds, whose design was selected by the assessor, Mr. Leonard Stokes, from those submitted in competition. The perspective view was exhibited at the Royal Academy Exhibition of 1902. The exterior is faced with Accrington bricks and dressings of terra-cotta, the roofs are slated with green Westmorland slates, and the building generally is of fireproof construction. The floors are laid in wood blocks and marble mosaic, and the walls of the public rooms are lined with a dado of glazed tiles. The accommodation provided consists on the ground floor of reading-room, lending library, ladies' room, and librarians' room. The juveniles' room is situate on the lower ground floor, together with the usual offices, etc. The irregular lines of the site on the north and east sides presented some difficulty in obtaining regular-shaped rooms; this has been overcome in the large reading-room by an arrangement of piers, which also permitted the adoption of cross-lighting and ventilation by means of clearstory windows. At the east end a street improvement has been effected by the semi-circular ladies' room, thereby widening the somewhat congested approach to Marshall-street. The principal reading-room is a lofty apartment, being 26 ft. 6 in. from the floor to the crown of the waggon roof, with a view to securing an ample volume of air, and preventing the vitiated condition of atmosphere that generally exists in a public reading-room. The turret is utilised for a ventilating fan, connected by means of trunks and tubes with the various rooms. The fittings generally have been arranged on lines laid down by the Chief Librarian for the purpose of effective supervision, and are executed in teak and oak. The building has been erected by Messrs. Armitage and Hodgson, contractors, Leeds, whose tender for the whole of the trades was accepted by the City Council. The fittings and cabinet work generally have bene carrried out by Messrs. Goodall, Lamb, and Heighway (Manchester), Mr. J. H. Gash (Leeds) supplying the chairs; and the electric light has been installed by Messrs. Wallis and Watson, of Leeds. Mr. H. Jones acted as clerk of the works.

ADMINISTRATIVE OFFICES, BARRY.—New administrative offices are now being erected at Barry Dock, to meet the needs of the Mercantile Marine as well as the Customs officers. With frontages of 96 ft. on one side and 64 ft. on the other side, the area covered will be about 700 square yards. One front will be on the Dock View and the other on the Station-road. The ground floor will be taken up by engagement-room, discharge-room, cashier's offices, superintendents' and board rooms, with waiting-rooms, and other necessary offices, including the shippers' store-room. The first floor will contain the large long-room for Customs purposes, with collectors', examiners', surveyors', clerks', and other officers' rooms. The building will be of brick, with stone dressing, and the total cost will be about 11,000*l.* Mr. Watkin Williams is the contractor, and the plans, etc., have been prepared at his Majesty's Office of Works.

AUDREY HOUSE, ELY-PLACE, LONDON.—This building is situated in Ely-place, not far from Holborn-circus. The structure covers a superficial area of 13,824 square ft., and has a frontage of 135 ft. in Portland stone, the style adopted by the architects (Messrs. H. H. and M. Collins, of Old Broad-street) being Renaissance, freely treated. The building consists of five stories and a basement, and contains over 200 rooms.

BUILDING IN HULL.—The Hull Corporation Works Committee dealt on the 11th inst. with and approved the following plans:—J. Mitchell (amended), hotel, Marfleet; G. Twell, sixteen houses, Scarborough-street; Hill and Stevenson, six houses, Spring-bank West; A. G. Beaumont, six houses, Beverley-road; J. Mollekin, eight houses, Carrington-street; E. Morrison, workshop, West Parade; J. Wilson, stables, Pearson Park; J. Dufton, greenhouses, St. George's-road; Rev. — Hall, alterations, Pryme-street; Sissons Bros., workshop, Bank-side; T. Hill (amended), shed, Beverley-road; C. Webster (amended), cart-shed, Prince's-road; G. Moore, porch, Westbourne-avenue.

OAKWELL JOINT HOSPITAL, BIRSTALL.—The Oakwell Joint Hospital, which has been in course of erection at Foxhall, Birstall, during the past twelve or fifteen months, was formally opened a few days ago. The hospital has been erected from plans prepared by Mr. J. W. Burrows, architect, of Birstall and Mirfield.

FREE LIBRARY, PENARTH.—On the 11th inst., the Penarth Free Library Committee considered plans for the new library prepared by Mr. H. Snell. It is proposed to erect a clock tower at one end of the buildings, and it was decided to recommend the Council to have the exterior consaructed of Newbridge stone, with red tiled roof. The building is the gift of Mr. Carnegie, and the site the gift of Lord Windsor.

RESTORATION OF CHAPEL, CARISBOOKE CASTLE.—Excavations have been begun in connexion with the proposed restoration of the ancient chapel of St. Nicholas, within Carisbrooke Castle, as a national memorial to Charles I. The ancient floor of the chapel has been brought to light about 3 ft. below the present level, and the jambs of the door in the north wall have been discovered, showing an entrance of about 3 ft. in width, with roll mouldings of the thirteenth century. The architect is Mr. Percy Stone, F.S.A.

WESLEYAN CHAPEL, LIVERSEDGE, YORKSHIRE.—Memorial-stones have just been laid of a Wesleyan Church at Millbridge, Liversedge. The building will occupy a corner site at the junction of the Halifax and Leeds to Huddersfield roads. Messrs. Thomas Howdill and Son, of Leeds, are the architects, and the chapel will afford accommodation for about 380 persons. There will be a tower rising to 70 ft. at the south-east corner, and at the opposite end an octagonal chancel.

STAINED GLASS AND DECORATION.

BRETTENHAM, NORFOLK.—The final touches to the restoration of this church have just been made. All the windows have been filled with stained glass, and a carved oak reredos with painted panels of scriptural subjects has been fixed over the altar. A new organ has been placed in the north transept. Oak panelling, sedilia, credence, and choir stalls of very elaborate design have been executed for the chancel. A carved oak rood screen spans the chancel arch. The chapels of the north and south transepts are divided from the nave by a wrought iron grille, and a similar screen divides the tower from the nave. All the walls of the church have been painted and decorated with diaper work. From the roof hang wrought-iron electroliers of elaborate design. The floors are laid with marble slabs, rough, white, and dove colour. A carved oak pulpit and brass eagle lectern were also supplied. The whole of the work was undertaken and executed by Messrs. Percy, Bacon, and Brothers, of London, W., at a cost of 2,350*l.*

MEMORIAL WINDOW, NORTHAMPTON.—A stained-glass memorial window has been placed in the Church of St. Sepulchre, Northampton, in memory of the men of the 2nd Battalion of the Northamptonshire Regiment who fell in the late war. The artist for the work is Mr. Arthur J. Dix, of London.

SANITARY AND ENGINEERING NEWS.

WATER SUPPLY, MARYTAVY, DEVONSHIRE.—Mr. E. A. Sandford Fawcett, M. Inst. C.E., one of the Local Government Board inspectors, held an inquiry at the schoolroom, Marytavy, on the 10th inst., to consider the application of the Tavistock Rural District Council for permission to borrow 2,500*l.* for the purpose of providing a water supply for Marytavy. Mr. G. D. Bellamy, C.E., Plymouth, engineer of the scheme, and others gave evidence.

ELECTRICITY WORKS AND DISINFECTOR STATION FOR BETHNAL GREEN.—In a Report issued on Monday, the Electricity Committee of Bethnal Green Borough Council state they have arranged to purchase for 4,500*l.* the freehold interests of twenty-two houses surrounding Marian-square and the square itself as a site for electricity and dust destructor works. It was further reported that the Public Health and the Finance Committees have decided to erect a disinfecting station, to cost about 3,000*l.*, at Digby-street depot.

WATERWORKS, SWANSEA.—Mr. Hill, the Consulting Engineer, as the result of his last inspection, gives a satisfactory review of the progress of the Cray Waterworks undertaking. The average number of men employed now is 680, compared with 580 at the same time last year. The total quantity of masonry concrete put in the dam is 59,360 cubic yards. The total value of the work done is over 150,000*l.*

FOREIGN.

FRANCE.—M. Georges Berger has been elected a member of the Académie des Beaux-Arts, in place of M. Roujon, who has been appointed Perpetual Secretary. The new Academician is 69 years of age. He was Director-General of the 1889 Exhibition, and is President of the "Union Centrale des Arts Décoratifs"; he is a Deputy of Paris, and Grand Officier of the Legion of Honour.——The Municipal Council of Paris has decided to rebuild the Jean Baptiste Say Schools, from the plans of M. Salard, at an estimated cost of 284,700 francs.——The Department of Fine Arts has just completed the restoration of the Salle des Fêtes and the Salle des Gardes at the Château of Annecy, one of the finest specimens of French mediæval architecture.——A new post and telegraph office is to be built at Lyons.——The jury of the competition opened at Auxerre for new savings' bank, has awarded the first premium to M. Rousseau, of Auxerre.——M. Le Sage, architect, of Rouen, has obtained the first premium in the competition for a new savings' bank at Coutances, and for the restoration of the Hôtel de Ville.——Important additions are being made to the museum buildings at Dijon. A new gallery has been opened, to be devoted to the works of French painters of the latter half of the neineteenth century.——M. Nénot has been elected President of the "Société Centrale des Architectes Français," MM. Lucien Etienne, Bartaumieux, and Bellemain (Lyons), have been elected Vice-Presidents.——A committee has been formed in Paris to raise a monument to Isabey. It is to be completed for the centenary of the artist's death, in July, 1904.——The twenty-first exhibition of the "Société Internationale de Peinture et de Sculpture" is open at the Georges Petit Gallery. It includes portraits by Mr. W. Bartlett and Mr. Sargent, landscapes by Mr. Harrison, and sculpture by M. Bernstamm and M. Mercié.——The Versailles Museum has acquired the celebrated picture by David of Marat in his bath, which belonged to Napoléon.——M. Marcel Lambert, the architect, is at present occupied with the restoration of the great reservoirs at Versailles, constructed under Louis XIV., to receive the water from the Marly aqueduct for the fountains and basins at Versailles.——The Municipality of Orthez is about to undertake the restoration of the historic Château of Moncade, built in 1242 by Gaston de Foix.——The ancient ramparts at Perpignan are to be demolished.——M. Detaille has just completed the sketch for his great composition, the "Chant du Départ," which is to complete the decoration of the Panthéon.——The Municipal Council of Paris has commissioned M. Poilpot to paint a large picture for the Victor Hugo Museum, representing the fête of the centenary of the poet on the Place des Vosges.——The French Government has given a favourable opinion in regard to the metropolitan railway scheme of M. Bérlier, the engineer. His proposed line is to go from Montmartre fortifications to Montparnasse and to Vaugirard fortifications, following the Rue de Vaugirard (with a stoppage at Montparnasse), the Rue de Rennes, the Boulevards Raspail and St. Germain, the Place de la Concorde, the Rues Boissy d'Anglas and Pasquier, to the Gare St. Lazare. Near this part there will be two branch lines, one to the Porte St. Ouen, the other to the Place des Abbesses at Montmartre.

SPAIN.—A recent issue of the *Madrid Gazette* contained a Royal Order appointing a commission charged with studying the hydraulic limes and cements of the country, with reference to their possible application in the construction of public works. This is in view of the establishment of new factories of hydraulic products, as well as the improvement in many cases of old ones.

MISCELLANEOUS.

THE CHRISTMAS HOLIDAYS.—Next week the *Builder* will be published on Thursday, and to ensure attention all communications for the Editor must reach our office not later than Wednesday morning next.

RECENT FIRE IN LAMBETH.—Messrs. John Appleby and Sons, whose works were in con-

siderable danger from the recent fire in the adjoining premises, ask us to mention that their business is being carried on as usual, all temporary damage having been made good.

LANTERN SLIDE ILLUSTRATIONS OF TIMBER.—Two specimens have been sent to us from a set of new lantern slides prepared by Messrs. Newton and Co., illustrating the growth and markings of timber, its structure, defects, and its appearance and behaviour in conversion for building purposes. Judging from the specimens sent, these slides would be very useful for any lecture on the structure and properties of timber, and supply a want in photographic illustration. The specimens sent show the comparative figure of medullary rays in English oak, beech, plane, and live oak, and a section of English cherry cut when green.

CHAUCER MEMORIAL.—A white marble bust of Geoffrey Chaucer was unveiled in the Guildhall library recently by the Lord Mayor. The bust was executed by Mr. G. J. Frampton, R.A.

RELIC OF AN OLD MANCHESTER DWELLING.—A problem of interest to antiquaries is set by the discovery under some business premises in Market-place of a cellar of curious construction. It is a vault about six yards square, and is a fine example of groining in brickwork. There is a short stone pillar in the centre, and from it rise the arches in the usual formation. There are also arches round the walls. The workmanship is excellent, and it is fresh and well preserved. There is no certainty as to the original purpose of the cellar. Its appearance strongly suggests a crypt, but there is very little to support the theory that the place was ever a crypt. From the evidence of the brickwork it seems unlikely that it is older than the beginning of the eighteenth century. In 1730 or thereabouts a common standard in the size of bricks was adopted. The bricks used in the construction of the cellar are of varying size, and they are for the most part smaller than those used after the middle of the eighteenth century. Underground rooms arched in a similar manner, only without the groining, have been unearthed in several places in the immediate neighbourhood of the centre of the city. This is certainly one of the best constructed, and the excellent groining marks it out among finds of the same nature. It is interesting to remember that it was close to this spot, if not upon it, that the house stood of John Byrom, the eighteenth-century Manchester poet. The site of Byrom's house is accurately known, but it has not yet been ascertained whether the chamber is beneath it. Assuming that it is, the most reasonable theory would seem to be that the place was originally built as the wine cellar of Byrom's house, though this is of course no more than a tentative suggestion.—*Manchester Guardian.*

NEWPORT MASTER BUILDERS' ASSOCIATION.—The annual banquet of the Newport Master Builders' Association was held recently at the King's Head Hotel, under the chairmanship of Mr. W. A. Linton, the President for the year. The Mayor (Mr. Clifford Phillips) supported the President, as also did Mr. A. S. Morgan, the Vice-Chairman, Alderman M. Mordey, Alderman T. Goldsworthy, Councillors T. Parry, F. P. Robjent, F. E. Burpitt, W. M. Blackburn, and H. C. Parfitt, Messrs. F. R. Bates, E. H. Fawckner, A. E. Garwood, Lyndon Moore, Dowling (Bristol Master Builders' Association), John Williams, S. F. L. Fox (Deputy Borough Engineer), H. Gratte, and others. The Chairman, in proposing "The town and trade of Newport" made some remarks upon the commercial and municipal status of Newport. The town had been alive to the true spirit of progress during the last quarter of a century. The population had doubled, the rateable value had been doubled, the number of houses had been trebled, and so also had the area of the town. But there was an obverse side to this picture. There was the town debt. The Mayor, who first replied, welcomed the criticism which the President had passed upon the Corporation, but thought that the administration of the town was thoroughly well looked after, and that there was a great and prosperous future for Newport. Alluding to the tramways as one of the big municipal undertakings, he believed that they would at the end of the first clear year's working be found to be paying a handsome profit. Alderman Goldsworthy also replied. Mr. Wm. Blackburn proposed "The Architects and Surveyors," to which Mr. Bates (President of the Newport Architects' Society) and Mr. Fox responded. Mr. Lyndon Moore proposed "The Building Trade," which was responded to by Mr. A. S. Morgan. A number of other toasts followed.

WORKMEN'S DWELLINGS, NEWCASTLE.—A joint meeting of the Sanitary and Estate and Property Committees of Newcastle Corporation was held on the 11th inst. Mr. Holford, Property Surveyor, presented plans on behalf of the Corporation, for the erection of 88 self-contained cottages, of four rooms, bathroom and scullery, and garden space, to be let at 6s. 9d. per week. It was explained that these houses in course of time would be self-supporting, as the money to be borrowed for this purpose was extended over a period of sixty years; and by the end of that time the buildings would belong absolutely to the Corporation. After considerable discussion as to whether the right class of buildings was being arranged for the right class of tenants, the subject was adjourned until a future meeting, in order that further particulars might be obtained. The sites suggested on which to erect the buildings are in the neighbourhood of Mill-lane and Shields-road, to the east of the car sheds.

SLATE TRADE.—A meeting of the Carnarvon quarry owners was held on the 5th, and it was decided to continue present prices and terms for the coming year. The Dinorwic and Penrhyn quarries are adopting a similar course. The Festiniog quarryowners are receiving large foreign orders, and have good prospects for next year.

"BRITISH ONLY IN NAME."—Reporting on the trade of Para, Brazil, for the year, 1902, the British Consul, Mr. Churchill, writes: "The Portland cement that comes here is British only in name. It comes from various countries, but the bulk originates from the banks of the Elbe. British barrels used to be too large, inconvenient to handle, and liable to break in transit, and to expose the contents to damage by water. British exporters were recommended to reduce the size, but the advice was not acted upon. German cement is put up in barrels of more suitable size, containing 120 kilos. (264 lbs.)."

EDINBURGH AND LEITH BUILDING EMPLOYERS' ASSOCIATION.—The Edinburgh, Leith, and District Building Employers and Allied Trades Association and the Building Trades Exchange held their annual dinner in the Royal British Hotel on the 10th inst., when 160 gentlemen were present. Councillor Neil M'Leod occupied the chair, and in the course of the evening stated that they had changed the name of their Association for the purpose of including in it all the trades which had now joined it, and also for attracting merchants to their membership. Their Association was started in the year 1871, when Mr. James Steel, now Sir James Steel, Bart., was elected President. The wages of masons at that time were 6½d. per hour and labourers 4½d. per hour. In 1876-77 masons' wages rose from 9½d. to 10½d., and work was plentiful and men scarce. In 1878 there was a strike of considerable magnitude among the plasterers. The Association went to the Master Plasterers, contributing to them a sum of 111*l.*, showing that when they liked they could help their neighbours when they were in a difficulty. That same year wages fell to 7½d.; and the following year a council of employers of all trades was formed for the object of having a uniform rate of wages fixed for all trades at 7½d. per hour and 4½d. for labourers. Masters then were far more aggressive than they were at the present time, for he did not think they would now try to face such a proposal. The trades included masons, joiners, bricklayers, lathers, plasterers, plumbers, painters, and, as they all knew, the suggestion was not adopted. In 1891 it was considered that a Conciliation Board should be constituted, with seven from the employers and seven from the operatives, whereby they might be able to settle all disputes that should arise. This did not succeed long. In time the operatives came as delegates with one object in view, from which they would not budge, and that was broken up. In 1897 the masons demanded an eight hours' day, which, after a strike, was agreed to, but in the following year the operatives asked to be allowed to return to the nine hours. The masters had sometimes to save men against themselves, as they had tried to do in this case, and he thought it would be some time again before they asked for shorter hours. In 1900 there was another strike, but the masters stood together splendidly and gained their point. The income in 1872 was 21*l.*, and last year it amounted for the year to 121*l.* 10s. Since their Association was started the joiners and plumbers had amalgamated with them, and this year they had instituted monthly meetings of their Executive, and they had found these a great success. Their Association might indeed become a great strength to the public life of their city if it would only assert itself, and in this connection he suggested that they might help to advance technical education by giving four or more bursaries to apprentice lads attending technical classes—for efficiency in masonry work and building construction, for carpentry, joinery, and construction in timber work, for plumbing and sanitation, for general knowledge of the composition of materials and their uses. The loyal toasts were then proposed by the chairman, and duly honoured, and Mr. Jas. Miller gave "The Imperial Forces," to which Colonel Bennett responded. "The Town Councils of Edinburgh and Leith" was submitted by Mr. James Moscrip. In replying on behalf of Edinburgh, Bailie M'Michael briefly referred to the death of Councillor Purves, than whom, he said, the citizens of Edinburgh had no more capable and devoted public servant. Bailie Craig, responding for Leith, remarked that the citizens of Leith had not given the Dean of Guild Court much work of late. Mr. A. Webster, Glasgow, proposed "The Association." Mr. Thomas Hume and Mr. W. Graham Yooll replied, the former commenting on the prosperity of the building trades in general by the fact that the members employed in those trades had almost doubled in the last thirty years; and the latter referring to the benefits to be derived from the Building Trades Exchange, and the greater success which had attended it of late. Other toasts included "The Architects and Surveyors," proposed by Councillar Forrest, and replied to by Councillor M'Arthy and Mr. J. C. Hamilton.

THE SANITARY INSTITUTE.—At an examination in Practical Sanitary Science, held in London on December 11 and 12, thirteen candidates presented themselves. The following nine candidates were granted Certificates:—G. J. Bridel, Greenwich; M. H. Butcher, Crouch End; E. C. Davies, Eye; W. J. Goode, Wellington; P. G. Jacobs, Assoc.M.Inst.C.E., London; J. E. King, Norwich; L. F. G. Loretz, Chiswick; O. W. Marsh, Dulwich; A. G. Young, Barking.

CARPENTERS' COMPANY TRADES TRAINING SCHOOL.—The prizes gained by students at this school during the year were distributed recently at Carpenters' Hall by Lord George Hamilton, M.P. The Master of the Carpenters' Company, Mr. Percy Preston, presided, and was supported by representatives of the City Guilds associated with the Carpenters' Company in conducting the school. Mr. Wilson, as chairman of the Joint Committee, briefly reviewed the work of the year. There were twelve classes in the school, and eleven were closely connected with the building trade. The school differed from other technical schools and from the polytechnics in the fact that all the students must be connected with the trade as working members before they could be admitted. The institution thus supplied in the best way the instruction which was formerly provided by the apprenticeship system, which had now unfortunately fallen into disuse. There had been a slight falling off in the number of students, and the total was now 241. The Director's detailed report having been read, Lord George Hamilton distributed the prizes.

THE CAERWENT EXPLORATIONS.—A second tesselated pavement from the Roman excavations at Caerwent, near Newport (Mon.), has been fixed in position in the museum of the Newport Free Library. It was found in what is known as House No. 7, from which the first was taken, and the two together form one of the most important discoveries of the kind yet made in Roman remains in England. Each is a very large example of tesselated floor work, and the second is distinctly the finer and more perfect of the two. Busts of the seasons and figures of animals and Cupids are conspicuous objects in the pavements. The chief features of House No. 7 were a small, partially-detached building, which may have been a shrine, and two rooms separated, no doubt, only by a curtain when the house was in use. It was these rooms that contained the tesselated pavements. One underlay the other, and the upper one was of later date and of inferior workmanship to the other, the latter being constructed with far more care as to detail and finish. Careful drawings and tracings of both pavements were made, and both have been removed in sections, and admirably and successfully put together again in the museum, imbedded on cement so durable that they will probably remain in as good a condition as they are now for hundreds of years. In both the rooms of House No. 7 the walls were standing to a height of 3 ft. above the floor level, and the plaster on them was nearly intact. It was, therefore, possible to recover to a considerable extent the colour and design of the wall decoration. It has been determined that the remains removed shall be housed at Newport, but so far the question of a separate building for their reception has not been decided, although there will in time be ample material to form a distinct Caerwent museum.—*Times.*

WATER BOARD AWARD.—At the London Water Arbitration Court on the 15th inst., Sir Edward Fry, the President, announced the award in the case of the East London Waterworks Company. A sum of 7,248,112*l.* was claimed by the company, but the Court assessed the amount to be paid as compensation at 3,900,000*l.* If the decision that the company was subject to the obligations of the "Chamberlain's Sinking Fund" should, however, be reversed on appeal to a higher court, the sum to be paid would be 4,300,000*l.* The Water Board must pay the company's taxed costs.

EXAMINATION OF WATER.—The Water Committee of the London County Council reported as follows at Tuesday's meeting of the Council:—"We have to report that during the months of October and November last 416 sam-

ples of water were taken by the chemist from the metropolitan water companies' mains, and 156 samples from the Rivers Thames and Lea above the intakes of the water companies. The chemist has submitted to us his report on the results of the analysis and the microscopical and bacterial examination of the samples, and we find that although the quantity of organic matter present in the water was small it was from two to five times as great as that present during the corresponding period of last year. The quantity of nitrogenous organic matter present also showed a remarkable increase. The unfiltered water taken from the Rivers Thames and Lea above the intakes of the water companies contained more organic matter than that examined in October and November, 1902. It is to be noted, however, that water drawn from the mains of most of the companies, which take water from the River Thames, contained on several days during November more nitrogenous organic matter than the unfiltered river water taken above the intakes of the companies. Undoubtedly the water supplied to the consumers during the past two months was very largely of indifferent quality. The chemist has also made a chemical, bacterial, and microscopical examination of a number of samples collected from wells in the Lea valley. Eleven out of thirteen samples were organically of a high degree of purity, while the remaining two were of fair quality. All the samples contained more saline ammonia than is found in the river water. From an analysis of the total solids in the samples it appears that many of them contained a larger quantity of mineral matter in solution and a smaller degree of hardness than much of the water supplied to consumers in London. . . ."

THE CHURCH CRAFTS LEAGUE.—The fourth annual general meeting of the League was held on Thursday of last week, in the Hall of Clifford's Inn, when the Dean of Westminster presided. In moving the adoption of the annual report, the Chairman referred at length to the work which the Society had accomplished. They had received 387 applications for advice, which had, in every case, been given without cost to the applicant, and they had placed the work of their artists in 94 churches. A number of interesting meetings had been held, which had been addressed by the Bishop of Worcester, Mr. J. T. Micklethwaite, Rev. Percy Dearmer, Mr. F. C. Eeles, and others. He also took the opportunity of saying how much the League owed to their President, the Bishop of Rochester, who was prevented from being present that evening, and also to their Secretary, for his painstaking work on their behalf. The following were then re-elected to serve on the Committee: the Hon. Mabel de Grey, the Dean of Westminster, Mr. Henry Holiday, Rev. Percy Dearmer, Mr. A. G. Walker, and Mr. W. Goscombe John, A.R.A. At the conclusion of the business a lecture was given by Mr. T. M. Rooke, in the course of which he described a deserted chapel of the Carthusians, situated in a wood near Liege, and afterwards exhibited some sketches, showing the twelfth century figure paintings on the walls.

LEGAL.

LONDON COUNTY COUNCIL DRAINAGE BY-LAWS.

ON December 11, before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Lawrance and Kennedy, the hearing of the case of the Metropolitan Industrial Dwellings Company *v.* Long was concluded on the appeal of the Company from a decision of Mr. Chapman, the Stipendiary sitting at the Southwark Police-court, who convicted the Company on thirty-three summonses taken out by the Southwark Borough Council.

The case came before the Court in the form of a special case stated by the Magistrate, from which it appeared that the appellants are the owners of Ponsonby-Buildings, which are industrial dwellings, erected before the confirmation of the drainage by-laws of 1901, made under Section 202 of the Metropolis Management Act, 1855. In December, 1902, the appellants, owing to the substitution of an iron pipe or drain for one of ordinary Doulton ware, found it necessary to put new traps and pans connected with thirty-three water-closets in their buildings, as the old traps and pans were broken during the progress of the work, but there was no change in the upright soil pipe. The local authority told them that the new traps must be fitted with anti-siphonage pipes in accordance with by-law 17 of the London County Council drainage by-laws, because by by-law 21 the by-laws were made applicable to new work in old buildings as far as practicable. The appellants refused to comply on the ground that these by-laws were not applicable, were unreasonable, and *ultra vires*. The local authority then took out thirty-three summonses for non-compliance in the case of each of the thirty-three closets, in order that the question might be settled in a court of law. The defendants called evidence that the soil pipes were of such dimension, viz., 5 in. in diameter, that the evils of siphonage could not possibly occur, and that the expense incurred to comply with the by-law was so great as to make the application impracticable. The local authority contended that the magistrate had no right to consider any question except the application of the by-law and its practicability, and the magistrate, with some hesitation, came to the conclusion that this contention was right. He set aside, therefore, the question of whether the by-law was necessary or even useful in this particular case. He did not think there was any evidence that compliance with the by-law was not practicable, and the figures, he said, given for probable expenses went far beyond the case, and he did not think they ought to affect his judgment. He thought, therefore, that the application was practicable, and that the work done involved the application of the by-laws to these traps. The learned magistrate also came to the conclusion that these by-laws under Section 202 were not *ultra vires*, and said he could not hold that they were unreasonable, though he regretted there was no proviso for the case where it was proved that there was practically no danger of siphonage. He therefore convicted the defendants, and fined them 40s. and 10*l*. 10s. costs on the first summons, and 2s. costs on each of the others. Hence the present appeal of the Company.

Mr. Danckwerts, K.C., and Mr. Courthorpe-Munroe appeared for the appellants, and Mr. Horace Avory, K.C., and Mr. Frank Dodd for the respondent.

At the conclusion of the arguments of Counsel, the Lord Chief Justice, in giving judgment, said he had come to the conclusion that the by-law was not sufficient to make that which was done the constructing of a water-closet within by-law 17, and the penalties ought not to be enforced. He did not aggree that by-law 21 was *ultra vires*, but the local authority had not brought within it what was done in this case.

The other judges concurred, and the appeal was accordingly allowed.

CLAIM AGAINST BUILDERS UNDER THE WORKMEN'S COMPENSATION ACT.

IN the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 10th inst., the case of Weavings *v.* Kirk and Randall came on for hearing on the appeal of the applicant from the refusal of Judge Addison, sitting at the Woolwich County Court, to award her compensation under the Workmen's Compensation Act, 1897.

Mr. Ruegg, K.C., and Mr. W. M. Thompson appeared for the applicant; and Mr. Arthur Powell, K.C., and Mr. A. Willis for the respondents.

Mr. Ruegg, in opening the applicant's case, said it was before their lordships on April 22 last (reported in the *Builder* of April 25, 1903) the question raised being whether the accident which admittedly happened to the workman happened in a "warehouse" which was entitled to be called a factory, and secondly, whether Messrs. Kirk and Randall, who were builders and contractors in a very large way of business, were for the time being the "occupiers" of the factory within the meaning of the Act. The facts of the case were these: The respondents, Messrs. Kirk and Randall, had entered into a contract with the Government to put up shelves in a place which formed part of the Woolwich dockyard, on which a large number of goods were to be stored for Army purposes. During the course of the work the applicant's husband, who was in the service of the respondents, fell and was killed. When the case was before this Court on the last occasion their lordships did not think that the evidence was clear as to what Messrs. Kirk and Randall's "occupation" was, and they sent the case back to the County Court Judge for him to finally report to this Court as to the user of the warehouse in question, and, if necessary, to take further evidence as to the "occupation," viz., as to in whose occupation the warehouse was at the time of the accident. The County Court Judge took further evidence and adhered to his opinion that Messrs. Kirk and Randall were not the "occupiers" of the warehouse, and it was from that decision that the present appeal was brought. Continuing, the learned Counsel said that the action originally was brought under the Employers' Liability Act. After hearing the evidence, Judge Addison thought the case under that Act failed, and then application was made to him to assess compensation under the Workmen's Compensation Act 1897. Judge Addison said he was unable to find any user or occupation by Messrs. Kirk and Randall which would make them "undertakers" within the meaning of the Act, but in case the Court of Appeal decided the contrary then he made an award in favour of the applicant for 312*l*.

Mr. Powell, in answer to a question from the bench, said he would admit that the place where the accident happened was a "warehouse" within the meaning of the Act. He understood that the Court of Appeal decided that point on the last occasion when the case was before it.

Mr. Ruegg said that that being so the only question now to be argued was whether Messrs. Kirk and Randall were the occupiers of that factory. He submitted that the facts showed that the respondents had undertaken to do work in a warehouse (the contract price was between 700*l*. and 800*l*.) and that they were for the time being the occupiers of the warehouse.

Mr. Powell, on behalf of the respondents, supported the finding of the County Court Judge that the respondents were not the "occupiers" within the meaning of the Act. A man who was sent to put shelves into a warehouse could not be deemed to be the occupier. To constitute the respondents the "occupiers" within the meaning of the Act there must be occupation *quâ* warehouse. It was not *quâ* warehouse at all that the respondents were in there. In this case Kirk and Randall had only a limited use of a portion of the wall in the room on which they were at work. That was not "occupation" within the meaning of the Act.

In the result their lordships allowed the appeal, holding that Messrs. Kirk and Randall were the "occupiers" within the meaning of the Act.

COLLS *v.* HOME AND COLONIAL STORES, LTD.—HOUSE OF LORDS.*

ON Thursday last week Mr. Bray continued his argument for the appellant, and dealt with the expert evidence as to the amount by which the light formerly enjoyed by the respondents would be interfered with. He referred to the rule of thumb usually accepted by architects, and submitted that as the new buildings were of a less elevation than would, taking the road as the base, support an angle of 45 deg., and the business of the respondents not being one that required special light, the interference was insufficient to maintain an action on. The learned Counsel then read the judgments given in the Court of First Instance and that of the Court of Appeal, and submitted that the judgment of Mr. Justice Joyce should be restored.

Mr. O. Leigh Clare briefly addressed the Court on the same side.

Mr. Haldane, K.C., then opened the respondents' case, and mentioned that before the writ was taken out, the Home and Colonial had approached Mr. Colls with a view of getting an undertaking that the new building on the old site should not be erected in such a way as to darken, injure, or obstruct any of their ancient lights, as the same were enjoyed previously to the taking down of No. 44, Worship-street. As these negotiations failed the present proceedings were commenced and an interim injunction applied for, but the buildings then being only of the same height as the old an undertaking was given pending the trial. Since the action the buildings had been carried higher. The learned Counsel then dealt with the expert evidence of Professor Thomas Roger Smith, Mr. Benjamin Tabberer, and Mr. Robert Willey to show that the new building would substantially and seriously diminish the access of light to the ground-floor of their premises. In order to displace their evidence the appellant had called Mr. Robert Vigers, who stated that he had formed the opinion that there would be at least 45 degrees of light left to the respondents' premises after the building was raised, and, as that in his experience was a very important point, he thought there was no real damage to the property, and that the letting and selling value in the ordinary way would not be in the least affected. Mr. Edward Blakeway I'Anson was another witness called by the appellant, and he went further than Mr. Vigers, and admitted in cross-examination that the new building would make a "large difference" to the light.

The Lord Chancellor: May we not take it that Mr. Justice Joyce rightly summed up the effect of the evidence on the one side and on the other? He says that the new buildings would deprive you of a substantial amount of light and cause material damage though light enough would be left for the ordinary purposes of occupancy of the premises as a place of business, and though the selling and letting value of the premises would not thereby be affected.

Mr. Haldane: Yes. Continuing, Counsel said on such a finding of fact the owner of ancient lights was entitled to an injunction. The learned judge had held the injunction ought not to go in this instance, because sufficient light was left for the ordinary enjoyment of the premises, as 45 per cent. clear still remained. But there was no rule of law, no rule of evidence, and no presumption or inference of fact—except per-

* See our last issue, p. 616.

haps of the very slightest kind—that where the angular height of an erection was less than 45 per cent. the access of light for ordinary purposes was sufficient, and no complaint could reasonably be taken to the interference of ancient lights.

Having dealt with the authorities cited by Mr. Bray,

Mr. Haldane submitted that the Court of Appeal were clearly right in refusing to order an inquiry as to damages. The Court had no power to compel the respondents to sell their property or rights to the appellant or any one else at a price to be fixed by the Court. What the appellant desired to take from the respondents was a right to light which the respondents held to be of great value to them. That right stood in the same position as a right in any other property when viewed merely from the point whether one man for his own interest and advantage had any power to make the owner thereof part from it against his will. The right to light was conferred on the respondents by the Prescription Act. It was an absolute and indefeasible right to the access and use of light to and for their building without reference to the purpose for which it had been used.

Mr. Hughes, K.C., followed. He addressed himself chiefly to the respondents' contention that they were entitled to an injunction, and that the order of the Court should be one to compel the appellant to lower his building by pulling down those parts of it which interfered with the clear access of light the respondents formerly enjoyed.

There was then a long discussion as to whether such an order could issue, their Lordships, by the questions they put, appearing to think that such an order, in face of the fact that there was an alternative remedy, might be one that they should hesitate to make. The learned Counsel was speaking when the further hearing was adjourned till Friday.

On Friday, Mr. Hughes continued his argument, and pointed out that if the new building was allowed to remain as built, the appellant had infringed a statutory right acquired under the Prescription Act, and the respondents had suffered a wrong, which apparently in that case the Court must be taken to have held they had no jurisdiction to remedy.

The Lord Chancellor: There is the alternative remedy of damages.

Mr. Hughes pointed out that if the appellant, instead merely of desiring to acquire the respondents' right to ancient lights, had claimed their premises, and had threatened to take them, no Court would for a moment have held that an offer to compensate the respondents ousted the respondents' right to refuse to part with possession. The parties by agreement could make terms which a Court of law would enforce, but the Court had no power to force either party to accept terms offered by the other, which, whether reasonable or not, they did not choose to accept. There was no question here of the "need of the public." When, for example, a tram company desired to take a man's house, apart from statutory powers because, they or the local authority might in the interest of the public deem it necessary that a dangerous corner should be pulled down, then the right of the individual, subject to compensation, became second to those of the public. No such element entered into the present question. He submitted the appeal should be dismissed.

Mr. Bray in a few words replied.

The Lord Chancellor, after consulting with the noble and learned Lords, said their Lordships will take time to consider, but whatever their decision may be they will not order the building to be pulled down.

The House then adjourned.

BRICKLAYER'S CLAIM UNDER THE WORKMEN'S COMPENSATION ACT.

THE case of Blovelt *v.* Sawyer came before the Court of Appeal, composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy on the 11th inst., on the appeal of the applicant from the decision of the County Court Judge of North Shields refusing to award him compensation under the Workmen's Compensation Act, 1897.

Mr. Ruegg, K.C., Mr. Chester-Jones, and Mr. Harold Morris appeared for the appellant; and Mr. Maynall for the respondent on the appeal.

Mr. Ruegg, in opening the case, said it raised a short point of considerable interest and importance. The facts were shortly these:—The applicant, a bricklayer, in the employment of the respondent, the "undertaker" within the meaning of the Act, at the time the accident occurred was engaged at work on a building 30 ft. high. The dinner hour commenced at 12 noon and continued till 1 p.m. At the trial the applicant said frankly enough that during the dinner hour it was open to him to stay upon the premises for his dinner or to go away and have it; but as a rule most of the men stayed at the works for their dinner. The men had suggested to the employer that a "mess-shanty" should be provided, as there was none, and the employer said he would have one put up, but this was not done. On the day the accident happened the applicant sat down under one of the walls of the building and pulled out his bag in which he had his dinner preparatory to eating it and then the wall fell on him.

The Master of the Rolls: I hope he had not built it himself.

Mr. Ruegg: Well, I think he built some of it himself; but I do not think that any blame attached to him. It was not, I think, suggested that he was guilty of any misconduct.

Continuing, the learned Counsel said that in consequence of the wall falling upon him the applicant was severely injured. Those were the whole of the facts. The County Court Judge said that as the applicant had sat down under the wall for the purpose of eating his dinner the accident did not arise "out of or in the course of the employment." His (Mr. Ruegg's) contention was that the accident clearly arose out of the employment because it was caused expressly by the fall of the building on which the man was engaged. It could not be contended that the accident did not arise out of the employment because it was one of the risks that a bricklayer ran.

Lord Justice Mathew: Was he paid wages the whole time

Mr. Ruegg: I do not know; but I submit that has nothing to do with it. There are a well ascertained number of hours that a bricklayer works in a week, which varies according to the district, and the time of year. But there is always an ascertainable number of hours. I am informed that the man did not actually get paid for the dinner hour.

Lord Justice Mathew: He gets paid for the number of hours in a week he is actually engaged.

The Master of the Rolls: Do not the men commence work at a particular hour, and stop work at a particular hour?

Mr. Ruegg: Yes.

The Master of the Rolls: Well, that embraces intervals during which they have their food.

Mr. Chester-Jones said he thought the practice was fairly well understood. Supposing that the men worked from 8 a.m. to 6 p.m. that would be ten working hours but it would only really amount to nine working hours, because one hour came out for dinner.

Mr. Ruegg said his contention was that the employment extended to the whole of the dinner hour. According to the learned County Court Judge the applicant appeared to have lost his right under the Act by sitting down to take his dinner. His submission was that the learned County Court Judge took too narrow a view of the scope of the Act, and that the accident did arise out of or in the course of the man's employment.

Mr. Maynall, for the respondent, said that the facts were that the applicant was employed by the hour and paid so much an hour.

Lord Justice Mathew: He would have an hour for his dinner. The term of his employment was that he should work so many hours and have an hour for his dinner, and that he should be paid for the number of hours that he worked. He must have that hour for his meal to enable him to do the work.

Mr. Maynall: No, the employment is really only by the hour, and the man could be dismissed at a moment's notice. The applicant received about 2*l.* a week. The week before the accident he said he received 2*l.* 1s. 3d. There was no dispute as to the nature and terms of the employment. In the dinner hour he was not in the employment of the master or receiving pay. The man was at liberty to go where he liked and do what he liked in the dinner hour. The day the accident happened was wet and windy, and the applicant and other workmen thought it more comfortable to sit under the shelter of the wall. It was a negligent act to sit under the wall.

The Master of the Rolls, in giving judgment, said he was of opinion that the appeal must be allowed. He thought, on the evidence, that the applicant was in the employment of the master during the whole of the day, viz., from the time he went to work until he came away, and consequently during the dinner hour, if he stayed on the works for the purpose of eating his dinner. It seemed to him that if the hour during which the man had his dinner could be brought in as part of the time which was given by the workman to the master for some purpose ancillary to the work, such as feeding himself—which was essential for a man to enable him to do his work, it would be stretching the technical view very far to say that the time of his dinner was a break off in his work until he commenced to work again. It was for the master's advantage that the man should have the means of feeding himself, and he would be able to do his work the better by being fed at this particular hour. Having his dinner on the works instead of going away for it might be for the master's convenience. It did not seem to his lordship, as a matter of law, that it could be said because a man was eating his dinner he was not in the master's employment. He thought, therefore, that the finding of the learned County Court Judge that because the applicant was not paid for the dinner hour, and was not at the time of the accident engaged on the main part of the work he had ceased to be in the employment of the master, could not be upheld. He thought that the accident which occurred did "arise out of or in the course of the employment," and that the appeal must be allowed, with costs.

The Lords Justices concurred, and the case was accordingly remitted to the learned County Court Judge for him to access the compensation due to the applicant under the Act.

CLAIM FOR INDEMNITY UNDER THE WORKMEN'S COMPENSATION ACT.

THE hearing of the case of McCabe and others *v.* Jopling and Palmer's Travelling Cradle, Ltd., concluded in the Court of Appeal composed of the Master of the Rolls and Lords Justices Mathew and Cozens-Hardy, on the 16th inst., on the appeal of the Company from an award made by Judge Lumley Smith, K.C., sitting at the City of London Court, under the Workmen's Compensation Act, 1897.

In this case the applicants were the dependents of a workman named McCabe, who was killed by an accident "arising out of or in the course of his employment." The facts were shortly as follows:—In the year 1902 Mr. Jopling, a builder, contracted to paint the outside of two houses for 159*l.* To do the work, Jopling entered into a contract with Palmer's Travelling Cradle, Ltd., for the supply, fixing, and removal of four travelling cradles upon the houses for 23*l.* Timber structures, consisting of 6 ft. jibs lashed with a ledger 22 ft. long, and fastened with wire ropes to the building, and also to weights of 56 lb., were fixed on the roof and between two jibs was fixed horizontal wire rope, from which the cradles were suspended. These cradles could be moved laterally by means of guy-ropes and vertically by pulleys and other ropes, by those using the cradles. This was the only scaffolding used in the work. It was admitted that the houses were more than 30 ft. in height. The cradles were fixed and removed by men in the employment of the Company, and McCabe was employed by the Company in fixing and removing the cradles, the painting work being done by Jopling's men. The painting work had been done about a month before the cradles were removed. While McCabe was engaged in removing one of the cradles from the house he fell to the ground and was killed. The Judge in the Court below held that the house was being repaired by means of scaffolding, and that the removal of the scaffolding was a substantial part of the process of repairing, and that as to this part of the work, the Company were the "undertakers" within the meaning of the Act. He therefore made an award of compensation, as against Jopling as "undertaker" (he admitted he was an "undertaker") under Section 4 of the Workmen's Compensation Act, but held that Jopling was entitled to be indemnified by the Company. Hence the present appeal of the Company.

Mr. S. T. Evans, K.C., M.P., and Mr. Minton Senhouse appeared for the appellants, and Mr. Ruegg, K.C., and Mr. D. M. Hogg for Mr. Jopling.

At the conclusion of the arguments of counsel, their Lordships upheld the decision of Judge Lumley-Smith, and dismissed the appeal with costs.

PATENTS OF THE WEEK.

APPLICATIONS PUBLISHED.*

25,932 of 1902.—J. W. PEARSON: *Brake Device for Hauling, Paying-out, Lifting, Lowering, and Winding Apparatus.*

A hauling, paying-out, lifting, lowering, or winding apparatus, consisting of a frame carrying a pulley or pulleys over which the rope passes, said frame being connected to a brake whereby the rope when paying-out or descending serves to apply the brake and when hauling or lifting releases the brake.

27,012 of 1902.—S. R. PARKES: *Coin-Operated Locks.*

A prepaid coin operated lock (wherein the coin does not fall into the till until the release mechanism is operated by closing the door) in combination with a coin chute open at its lower tapered extremity, through which portions of a proper sized coin project, two pivotted lever fingers whose lower converging ends retain the coin, an external knob connected to the upper end of the rearward and longer finger, the motion

* All these applications are in the stage to which opposition to the grant of Patents upon them can be made.

being transmitted through the medium of the aforesaid coin through the forward pivotted finger to the latch bolt, by which action the latter is withdrawn against the action of two springs.

28,003 of 1902.—S. C. DAVIDSON: *Stoves and Apparatus for Heating Air.*

According to this invention the heated products of combustion are caused to circulate around the exterior of the air-heating tubes, which are vertical or inclined and open ended, and enclosed in a suitable chamber, the walls of which also form air heating surfaces fitted with gills or not, and further the said tube chambers are so constructed that the joints of the tubes with the surfaces in which they are carried in the chamber or to one portion of the chamber with the other where likely to be affected by expansion, are made by what may be termed resting contact or joint, that is to say, the weight of one part on the other, together with sufficient surfaces in contact, serves to make a joint efficient for the purpose to prevent leakage of smoke, and at the same time allow the necessary expansion of the parts. In the case of the tubes the upper ends only take their weight by a suitable flange whilst their lower ends make a sliding joint, the upper joint may in some cases be reinforced with red lead or suitable cement.

28,755 of 1902.—A. KOCH: *Flushing Tanks for Water-closets.*

The novel feature of the flushing-tank with siphon-bell, which forms the subject of this invention, is that, in consequence of the siphon-tube and siphon-bell being adjustable, quantities or volumes of water, varying according to this adjustment, may be drawn from the tank to the closet basin. The higher the siphon-tube rises or the lower the bell descends in the tank the greater will be the quantity of water drawn or siphoned off. Another new feature of the flushing tank with a siphon-bell and regulateable water supply is that the same has an inlet opening without a floating ball cock in, or close to, the bottom of the tank.

510 of 1903.—B. J. B. MILLS. (F. Nuszbaumer.) *Pulley Blocks or Lifting Tackle.*

This invention consists of an improved pulley block or lifting tackle having an extra rapid return movement, in which the worm wheel placed above the endless screw may be separated from this latter by means of a lever operated by a chain or other suitable mechanism, so as to free the lifting chain when this latter is not loaded. Means are provided for preventing the separation of the screw and its worm wheel when the apparatus is loaded, this means consisting of a latch pivotted to the lever operating the worm wheel and passing between the axle of the screw and its stop, where it is nipped by the weight of the load.

1,191 of 1903.—E. WEAVERS: *Fire Escapes, and Suspension of Doors, Ladders, Scaffolds, Curtains, and the like.*

This invention relates to means for suspending fire escapes and doors, ladders, scaffolds, curtains and the like to buildings. According to this invention around the top of the building is fixed a track, preferably composed of a pair of steel tubes, upon which is mounted a trolley or the like, to which the fire escape, ladder, or the like, is adapted to be suspended. The trolley extends between the slot formed by the two halves of the track, and is provided with rollers, which run upon the slotted portion so that the said trolley can be moved along the track from end to end and carry with it the fire escape, ladder, or the like attached to it. The trolley is advantageously protected from the weather by means of a tubular metallic casing enclosing it, and an elevator can also be suspended from the track, the said elevator being adapted for raising and lowering cars, life lines, rope ladders, and the like, and providing an easy means of access to any window of the building.

1,202 of 1903.—S. TIMINGS: *Furniture Castors.*

In carrying out this invention the horn-piece is made in halves, that is to say the horn-piece is about the same outline shape as an ordinary cast-iron horn-piece, but it is made as two separate castings, the division being on the vertical centre-line from front to back. The vertical pin on which the horn-piece revolves is forged, or otherwise formed with a head at its lower end in place of the usual washer and rivetted over end, so that between this head and the collar of the pin is the part which is made of the proper shape and size to receive the horn-piece. Instead of the two horns of the horn-piece being drilled for the cross-pin of the castor bowl the cross-pin is dispensed with, and on each of the horn-pieces is cast a short inwardly projecting pip or peg of the proper size to enter the ends of the hole in the castor bowl, so as together to form the axle on which the castor bowl will revolve. The two halves of the horn-piece are secured together by a cross rivet which passes through the hole in the same from side to side at right angles to and at the back of the vertical pin, on which the horn-piece revolves, the two halves of the horn-piece being strengthened so as to receive this cross rivet. The outer ends of these holes for the cross rivet are cast counter-sunk to receive the rivet over the ends of the cross rivet. In order to effectually prevent the two halves of the horn-piece from turning on the cross rivet there is cast on the front of one-half a small projection which takes into a corresponding hole or notch in the other half.

1,504 of 1903.—M. SCHWEDER: *Automatically Regulated Apparatus for Heating Water and other Materials.*

A device for the automatic regulation of the gas burner in cooking vessels or boilers which are closed steam tight, such regulation being effected by means of a throttle valve arranged in the gas supply pipe and connected with a diaphragm, characterised in that the said vessel for boiling or cooking is connected with the diaphragm casing in such a manner that the steam pressure in the said vessel is transmitted directly to the diaphragm.

2,210 of 1903.—J. G. GLASSFORD: *Doors.*

This invention is designed to provide an attachment for doors or door frames to prevent draughts when the door is open, and to promote ventilation over the top of the door. It consists essentially in pivotting in front of the door or to the frame a screen or panel approximately the height of the door, which, when the door is partially opened, closes the aperture presented in front of it, leaving an angular space open above it through which a current of air may enter for the purpose of ventilation.

2,370 of 1903.—E. EATON: *Apparatus for use in the Manufacture of Bricks, Blocks, and the like.*

This invention relates to an apparatus for use in the making of sand bricks, or blocks, in which ground quick-lime, sand, ashes, clinkers, and other ingredients are used. The apparatus is formed of a number of compartments constructed in such a way that as soon as one of the compartments has been filled with lime, sand, or other materials it can be removed, and an empty one put in its place, which would be close to the mixing machine, and the contents of which were ready to be used, would in turn come into position opposite the press, and when emptied would again come into position opposite a mixing and filling machine to be again filled. The apparatus is arranged upon a large turntable, which is revolved by suitable gearing and power, and the mixing chamber feeds each compartment of the apparatus in turn, and in turn each compartment comes opposite the press, and while this compartment is being emptied and used, another is being filled by the mixer, and so on continuously.

18,766 of 1903.—W. H. WHEATLEY (C. F. Stone): *Window and other Sash Fasteners and Holders.*

As an article of manufacture, a securing device for window sashes or the like comprising a housing, having anchoring gears at opposite ends and openings at its outer side, and lugs formed upon each side of the housing and extending toward each other at right angles to said gears, a single U-shaped spring, the bend of which is engaged by said lugs, the ends of said spring projecting beyond the outer face of the housing, and provided with coincident apertures, and a notched rod passed through said apertures, and received within a vertical passage into the outer wall of the housing and having bearings in the upper and lower outer edges of the outer wall of the housing.

20,927 of 1903.—L. F. BETTS: *Gas Burners for Heating and Lighting.*

A gas burning heater, comprising a gas chamber having an inlet nipple and an annular deck, provided with a series of equally spaced jet holes, a centrally located boss on the top of said chamber, a cap having an aperture matching said boss and an annular flange above said deck, provided with a series of openings, each concentric to one of said jet holes, an annular depending skirt on said flange encircling said deck, a standard screwed upon said boss and holding said cap, a flame spreader on said standard above said cap, and a radiator having an inwardly-coned lower face serving as a reflector supported by said standard above said spreader.

21,269 of 1903.—W. CRISP: *Means for Raising Bricks and other Materials.*

A means for raising bricks and other materials wherein is provided a staging within which is free to run up and down the receptacle for the bricks or others materials, the said receptacle being raised and lowered by a chain, one end of which is attached to suspension rods above the receptacle and the other end to the bottom of the said receptacle, the said chain passing over suitably situated guide rollers and over a sprocket-wheel carried on a shaft, supported in a suitable framing and operated by a wheel, means being provided for keeping the chain in gear with the sprocket-wheel for preventing the receptacle running backwards, and for stopping it at any required height.

22,353 of 1903.—R. G. HOWSON: *Lavatory Basins and the like.*

This invention relates to lavatory basins and the like in which the overflow passage reaches through to the top of the basin. According to this invention, an inspection cover is provided for the overflow passage pivotted at one side so that it can be uplifted from the other. The inspection cover may be held down by spring pressure, which at the same time may be employed to hold it in its uplifted or open position. A lateral aperture or outlet is formed in the upper edge of the basin, which is normally covered by means of a removable grid that may be formed separate from the inspection cover, or secured to it or to the pins or other parts carrying the said inspection cover, or pivotted or otherwise mounted upon the basin, or provided as a downward extension from the inspection cover or otherwise as may be preferred in particular cases.

22,376 of 1903.—T. A. HEARSON (O. Schröder): *Artificial Marble Mass.*

An artificial marble mass consisting of a mixture of magnesite, chloride of magnesium, stone, leather, or wood dust, and an animal or vegetable binding material.

22,424 of 1903.—J. LEVICK: *Flushing Cisterns, and Water-waste Preventers, for Railway Carriage Lavatories and analogous uses.*

In combined siphon flushers and water-waste preventers, the arrangement in combination with a fixed standpipe of a rising and falling bell, the mouth of which is sealed, when in its lowered position, by a valve or equivalent device adapted to exclude water from the inside of the said bell.

22,432 of 1903.—C. M. DORMAN and R. A. SMITH: *Electrical Ceiling Fittings.*

A ceiling fitting consisting of a box or base without terminal fittings, and an insulating cover to the upper or inner side of which the terminal fittings are attached, the arrangement being such that when the cover is lifted up approximately into position, bared portions of the line wires engage with the terminals, and are fixed in position by screws.

22,476 of 1903.—G. T. RICHARDSON: *Hinge Fittings for Fanlights, Casements, and the like.*

A hinge fitting for fanlights and the like, comprising a plate provided with an inclined flange and having a pivot upon it, and another plate having an inclined slot into which the said pivoted pin projects, in combination with a tongue or stop for preventing the movement of the slotted plate relatively with the pivot.

22,523 of 1903.—J. D. BENNET: *Furniture Lock.*

The lock comprises a casing made up of a front plate and back plate, and enclosing sides or flanges which may be of the usual construction, excepting that the sides are formed with ribs which are adapted to fit into grooves cut in the wood work of the desk or other article of furniture, and not only facilitate the driving of the lock into place, but secure it, without the use of screws, against lateral movement. The top plate of the lock is formed with an orifice through which passes the eye of the keeper, which is in the form of a disc, to facilitate fitting by simply boring out a shallow recess in the wooden lid by means of a boring bit. Within the casing of the lock are pivoted on the back plate two catch levers, pressed inwards by means of springs, also secured on the back plate, the outer ends of the catch levers being curved or inclined, so that on closing down the desk lid the bevelled lower end of the eye of the keeper entering the orifice presses apart the catch levers until it clears the catches, which then enter the eye, and by securely retaining the keeper, lock down the desk lid, the desk being thus self-locking. For unlocking the desk, a duplex or double-leafed key is used, and is inserted through the keyhole, the clefts in the key being made to fit the wards in the lock. On turning the key one quarter turn, the leaves press apart the catch levers to free a keeper, whereupon the desk lid may be raised.

22,525 of 1903.—J. D. BENNET: *Castors.*

The castor comprises an axle carrying two small wheels running freely thereon, said axle having rigidly secured to it a post or pintle, which is embraced by a socket composed of a split sleeve constituting a spigot to fit into a socket, bored out of the leg of a table, the base of a blackboard for schools, or other article of furniture. A concavity is formed in the end of the pintle and in the sleeve, whereinto is fitted a ball to serve as a thrust bearing for the castor, so that the latter may turn freely on a vertical axis.

1,423 of 1903.—R. GRIMM: *Roofs, Beams, Girders, and like Structures, of Concrete and Iron.*

A concrete and iron girder and the like, in which the metal insertions are embedded whilst under tensional strain in the concrete of the girder, and the bearing portions of the girder are formed by metal insertions projecting from the concrete at both ends of the girder and connected to metal pieces resting freely on the supports of the girder.

4,920 of 1903.—J. SMURTHWAITE and W. FISHER: *Float Valves.*

This invention consists of a cast or otherwise provided metallic body, the upper portion of which is adapted for connexion with the supply pipe in any suitable manner, and has formed therein a central vertical passage for the reception of a vertically operating piston valve, the lower end of which said valve is adapted for connexion with a crank lever carrying the usual ball or other float. The upper end of the said piston valve has a resilient surface of leather or other suitable material, retained in position by a cap having an open top, so that the said valve when raised by the float lever, may close the passage between the said body and the water service, the said body being so formed internally as to provide a circular chamber, around which the incoming water flows when the said piston valve is lowered, by the lowering of the float from which said chamber the water flows into the cistern through an oblong or elliptical passage of larger area than the inlet, thereby spreading the water and directing the same on to the side of the cistern, away from, instead of through, the working parts of the valve as hitherto.

21,912 of 1903.—A. W. ELLIS and F. F. FARRIER and W. M. FRASER.: *Joints or Unions of Rods and the like for use in Cleaning Drain Pipes and for similar purposes.*

This invention consists of an improved joint or union for connecting the ends of rods, consisting in the employment in conjunction with a socket having a right and left-handed thread and a socket adapted to engage with the aforesaid socket, of a collar which screws over both sockets and prevents the male end becoming loose.

MEETINGS.

FRIDAY, DECEMBER 18.

Architectural Association.—Mr. G. P. Bankart on "Old Stucco and Plaster Work, with Reference to Modern Possibilities." 7.30 p.m.

Institution of Mechanical Engineers.—Mr. C. E. Stromeyer and Mr. W. B. Baron on "The Working of Various Water-softeners." 8 p.m.

Institution of Civil Engineers (Students' Meeting).—(1) Mr. C. B. Case on "The Action of the Sea upon the Foreshore." (2) Mr. F. W. Cable on "The Causes of the Loss of Beaches." 8 p.m.

Glasgow Architectural Craftsmen's Society.—Debate: "Should Architects be Final Arbiters in Disputes on Contracts for their own Work?" Affirmative: Mr. R. N. Horn, A.R.I.B.A. Negative: Mr. Isaac Low, jun. 8 p.m.

SATURDAY, DECEMBER 19.

Junior Institution of Engineers.—Visit to the Electricity Works of the Walthamstow Urban District Council. Train leaves Liverpool-street at 2.23 p.m.

Builders' Foremen's Association (Memorial Hall, Farringdon-street).—Monthly meeting, 7.30 p.m.

MONDAY, DECEMBER 21.

Liverpool Architectural Society.—Paper by Mr. E. Bertram Kirby.

TUESDAY, DECEMBER 22.

Institute of Sanitary Engineers, Ltd. (Lectures in Practical Sanitary Science).—Mr. B. R. Tucker on "Ventilation of Dwellings and Public Buildings." 7 p.m.

Institution of Civil Engineers.—Mr. T. E. Stanton, D.Sc., on "The Resistance of Plane Surfaces in a Uniform Current of Air." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

December 5.—F. PITTIS & SON (At Newport, I.W.)

Arreton, Isle of Wight.—Sullen Farm, 26 a. 0 r. 20 p., f., y.r. 65*l.* £1,200

December 7.—By GILBERT & HOW.

Finsbury Park.—100, Stroud Green-rd. (S), u.t. 64 yrs., g.r. 9*l.* 9s., y.r. 85*l.* 1,050

December 8.—By W. B. HALLET.

Hampstead.—100, King Henry's-rd., u.t. 49 yrs., g.r. 12*l.* 10s., e.r. 75*l.* 550

By MARK LIELL & SON.

Bow.—26 and 28, Spanby-rd., u.t. 59 yrs., g.r. 7*l.*, w.r. 67*l.* 12s. 510

By PRICKETT & ELLIS.

Hornsey Rise.—20, Ashmount-rd., u.t. 78 yrs., g.r. 8*l.* 8s.; e.r. 52*l.* 485

By EDWARD SIMPSON.

Old Kent-rd.—124, Trafalgar-rd., u.t. 69 yrs., g.r. 7*l.* 7s., w.r. 44*l.* 4s. 310

New Cross.—16 and 18, Gellatly-rd., u.t. 55 yrs., g.r. 10*l.* 10s., w.r. 62*l.* £645

Lewisham.—79 and 81, Elswick-rd., u.t. 52 yrs., g.r. 8*l.*, w.r. 67*l.* 12s. 535

By ROGERS, CHAPMAN, & THOMAS.

Chiswick.—Devonshire-rd., f.g.r's 56*l.*, reversion in 75 yrs. 1,385

Putney.—3 to 21 (odd), Gwalior-rd., u.t. 76 yrs., g.r. 63*l.*, w.r. 364*l.* 2,305

67, Gardener's-la., u.t. 73½ yrs., g.r. 5*l.*, w.r. 36*l.* 8s. 310

14 and 16, Emily-ter., u.t. 76 yrs., g.r. 16*l.*, y.r. 81*l.* 840

192, Upper Richmond-rd. (s), u.t. 65 yrs., g.r. 9*l.* 10s., y.r. 90*l.* 1,220

45 and 47, Disraeli rd., f., y.r. 70*l.* 1,055

4, 6, 8, and 10, Bective-cres., w.r. 114*l.* 10s. 1,025

Wandsworth.—2, Gorst-rd., u.t. 77 yrs., g.r. 7*l.* 10s., y.r. 40*l.* 430

Pimlico.—25, Sussex-st., and 42, Cumberland-st., u.t. 30 yrs., g.r. 14*l.*, y.r. 128*l.* 8s. 625

31, Belgrave-rd. (s.), u.t. 23½ yrs., g.r. 5*l.*, y.r. 160*l.* 1,520

16, Effingham-st., u.t. 31 yrs., g.r. 8*l.*, y.r. 48*l.* ... 455

By G. HASLETT (at Masons' Hall Tavern).

Lambeth.—Stangate-st., The Spread Eagle p.-h., u.t. 39½ yrs., y.r. 125*l.*, with goodwill 15,300

Blackfriars.—Blackfriars-rd., The Bell p.-h., u.t. 19¾ yrs., y.r. 180*l.*, with goodwill 4,500

By WARLTERS, LOVEJOY, & TELFER (at Masons' Hall Tavern).

Norwood.—Beulah Hill, The Conquering Hero p.-h., f., y.r. 80*l.* 8,000

December 9.—By GEORGE BILLINGS.

Hackney.—19 and 21, Bradstock-rd., u.t. 43 yrs., g.r. 9*l.*, w.r. 78*l.* 550

36, Bradstock-rd., u.t. 42 yrs., g.r. 1*l.* 5s., e.r. 39*l.* 325

By WM. CLARKSON.

Poplar.—9, 11, and 13, Ricardo-st., and 1 and 3, Annabel-st., u.t. 25 yrs., g.r. 13*l.*, subject to payment of 30*l.* on a life aged 84 235

By WAGSTAFF & SONS.

Hampstead.—46, Fortune-green-rd., f., e.r. 55*l.* ... 700

Fortune-green-rd., f.g.r. 10*l.*, reversion in 95 yrs. 250

Holloway.—12, Hargrave-rd., u.t. 80 yrs., g.r. 7*l.* 15s., e.r. 42*l.* 400

Tottenham.—40, Braemar-rd., with nursery grounds, area ¼ of an acre, f., y.r. 32*l.* 535

2, May Cottages, f., w.r. 39*l.* 470

Avenue-rd., f.g.r. 15*l.*, reversion in 59 yrs. 370

By J. THORNBOROUGH (at Bishop Auckland).

Bishop Auckland, Durham.—Etherley-la., 8 fields, 25 a. 0 r. 16 p., f. and c. 2,650

Cockton Hill, three plots of land, area 22,366 yds., c. 1,725

South Church-rd., two fields, 5 a. 3 r. 19 p., with hospital and cottage thereon, f. and c. 1,175

Cradock-st., two fields, 6 a. 2 r. 21 p., f. and c. 1,185

December 10.—By BEALE & CAPPS.

Bayswater.—32, Kildare-ter., u.t. 47¼ yrs., g.r. 7*l.*, y.r. 65*l.* 665

Kensington.—25, Campden-st., u.t. 19½ yrs., g.r. 4*l.* 10s., y.r. 30*l.* 265

By H. J. BLISS & SONS.

Dalston.—7 to 17 (odd), Trederwen-rd., u.t. 79 yr., g.r. 36*l.*, w.r. 249*l.* 12s. 1,895

Spitalfields.—1 and 2, Parliament-ct., f., w.r. 124*l.* 16s. 600

Bethnal Green.—226, Bethnal Green-rd. (s.), f., y.r. 50*l.* 785

Forest Gate.—52, Claremont-rd., u.t. 73 yrs., g.r. 10*l.* 10s., e.r. 55*l.* 560

Clapton.—Powerscroft-rd., f.g.r. 10*l.*, reversion in 71½ yrs. 225

By CHESTERTON & SONS.

Kensington.—19 and 21, Holland-st., f., y.r. 125*l.* 2,725

Church-walk, f.g.r. 12*l.*, reversion in 16½ yrs. ... 1,100

St. John's Wood.—16, Hamilton-ter., u.t. 31 yrs., g.r. 15*l.*, e.r. 130*l.* 925

Pimlico.—136a, Grosvenor-rd. (The Riviera Studios), u.t. 26 yrs., g.r. 62*l.* 10s., y.r. 210*l.* .. 400

By J. G. DEAN & Co.

Wandsworth.—32, Baskerville-rd., u.t. 75½ yrs., g.r. 12*l.* 12s., e.r. 70*l.* 785

By C. C. & T. MOORE.

Poplar.—55 and 57, Pennyfields, f., w.r. 81*l.* 2s. ... 750

By STIMSON & SONS.

Holloway.—Tabley-rd., f.g.r. 21*l.*, reversion in 63 yrs. 550

Junction-rd., f.g.r. 12*l.* 10s., u.t. 63 yrs., g.r. nil 250

Wandsworth.—Bennerley-rd., f.g.r.'s 41*l.*, reversion in 74 and 73 yrs. 1,045

Wakehurst-rd., f.g.r.'s 122*l.* 18s., reversion in 74 yrs. 3,180

Belleville-rd., f.g.r.'s 61*l.*, reversion in 74 yrs... 1,580

East Hill, f.g.r.'s 91*l.*, reversion in 82 yrs. 2,360

Herndon-rd., f.g.r.'s 89*l.*, reversion in 82 yrs.... 2,255

Knoll-rd., f.g.r.'s 224*l.*, reversion in 82 yrs. 5,561

Eglantine-rd., f.g.r.'s 95*l.* 11s., reversion in 82 yrs. 2,370

Southfields-rd., f.g.r.'s 27*l.* 12s. 8d., reversion in 74 yrs. 677

Haldon-rd., f.g.r.'s 31*l.*, 12s., reversion in 74 yrs. 760

Sedleigh-rd., f.g.r. 15*l.*, reversion in 74 yrs. 380

December 11.—By T. A. CHALLENGER.

Notting Hill.—4, 6, and 8, Hesketh-pl., and 5 and 6, Thomas-pl., u.t. 26 yrs., g.r. nil, y.r. 20*l.* 260

14 and 16, Hesketh-pl., u.t. 26 yrs., g.r. nil, y.r. 39*l.* 460

By MIVERT & CO.

Regent-st.—26, King-st., f., y.r. 100*l.* 2,970

Marylebone.—244 and 248, Great Portland-st, (s.), u.t. 27½ yrs., g.r. 50*l.*, y.r. 385*l.* 4,960

Hyde Park.—7, Connaught-sq., u.t. 4¾ yrs., g.r. 17*l.* 4s., p. 270

By VENTOM, BULL, & COOPER.

Acton.—8, 10, and 20, Messaline-av., f., y.r. 160*l.* ... 2,325

***Contractions used in these lists.*—f.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; ls. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beer-house; p.h. for public-house; o. for offices; s. for shops; ct. for court.**

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.		
Hard Stocks	1 16 6	per 1,000	alongside, in river.
Rough Stocks and Grizzles	1 13 0	„	„ „
Facing Stocks	2 12 0	„	„ „
Shippers	2 5 0	„	„ „
Flettons	1 10 0	„	at railway depôt
Red wire Cuts	1 13 0	„	„ „
Best Fareham Red	3 12 0	„	„ „
Best Red Pressed Ruabon Facing	5 0 0	„	„ „
Best Blue Pressed Staffordshire	4 4 0	„	„ „
Do. Bullnose	4 10 0	„	„ „
Best Stourbridge Fire Bricks	4 8 0	„	„ „
GLAZED BRICKS.			
Best White and Ivory Glazed Stretchers	13 0 0	„	„ „
Headers	12 0 0	„	„ „
Quoins, Bullnose, and Flats	17 0 0	„	„ „
Double Stretchers	19 0 0	„	„ „
Double Headers	16 0 0	„	„ „
One Side and two Ends	19 0 0	„	„ „
Two Sides and one End	20 0 0	„	„ „
Splays, Chamfered, Squints	20 0 0	„	„ „
Best Dipped Salt Glazed Stretchers and Headers	12 0 0	„	„ „
Quoins, Bullnose, and Flats	14 0 0	„	„ „
Double Stretchers	15 0 0	„	„ „
Double Headers	14 0 0	„	„ „
One Side and two Ends	15 0 0	„	„ „
Two Sides and one End	15 0 0	„	„ „
Splays, Chamfered, Squints	14 0 0	„	„ „
Second Quality White and Dipped Salt Glazed	2 0 0	„	less than best.

	s. d.		
Thames and Pit Sand	6 9	per yard,	delivered.
Thames Ballast	6 0	„	„
Best Portland Cement	30 0	per ton,	delivered.
Best Ground Blue Lias Lime	21 0	„	„

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fire Clay in sacks 27s. 6d. per ton at rly. dpt.

STONE.

	s. d.		
BATH STONE—delivered on road waggons, Paddington depôt	1 6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	„	„
PORTLAND STONE (20 ft. average)—			
Brown Whitbed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 1	„	„
White Basebed, delivered on road waggons, Paddington depôt, Nine Elms depôt, or Pimlico Wharf	2 2½	„	„

	s. d.		
Ancaster in blocks	1 11	per ft. cube,	deld. rly. depôt
Beer in blocks	1 6	„	„
Greenshill „	1 10	„	„
Darley Dale in blocks	2 4	„	„
Red Corsehill „	2 5	„	„
Closeburn Red Freestone	2 0	„	„
Red Mansfield „	2 4	„	„

YORK STONE—*Robin Hood Quality.*

	s. d.		
Scappled random blocks	2 10	per ft. cube,	deld. rly. depôt
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per foot super.	„
6 in. Rubbed two sides Ditto, Ditto	2 6	„	„
3 in. Sawn two sides slabs (random sizes)	0 11½	„	„
2 in. to 2½ in. Sawn one side slabs (random sizes)	0 7½	„	„
1½ in. to 2 in. ditto, ditto	0 6	„	„
Scappled random blocks	3 0	per ft. cube	„
6 in. sawn two sides, landings to sizes (under 40 ft. sup.)	2 8	per ft. super.	„
6 in Rubbed two sides Ditto	—	„	„
3 in. sawn two sides slabs (random sizes)	1 2	„	„
2 in. self-faced random flags	0 5	„	„
Hopton Wood (Hard Bed) in blocks	2 3	per ft. cube.	
„ „ „ 6 in. sawn both sides landings	2 7	per ft. super.	deld. rly. depôt.
„ „ „ 3 in. do.	1 2½	„	deld. rly. depôt.

SLATES.

in. in.	£ s. d.		
20×10 best blue Bangor	13 2 6	per 1000 of 1200	at rly. dep.
20×12 „ „	13 17 6	„	„
20×10 best seconds „	12 15 0	„	„
20×12 „ „ „	13 10 0	„	„
16×8 best „	7 0 0	„	„
20×10 best blue Portmadoc	12 12 6	„	„
16×8 best blue Portmadoc	6 12 0	„	„

[See also next page.

PRICES CURRENT (*continued*).

SLATES.

in. in.		£ s. d.	
20×10	best Eureka unfading green	15 2 6	per 1000 of 1200 at rly.dep
20×12	best Eureka unfading green	17 2 6	
18×10		12 10 0	" "
16× 8	" "	10 5 0	" "
20×10	permanent green	11 10 0	" "
18×10		9 10 0	" "
16× 8	" "	6 10 0	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1,000 at rly. depot.
Hip and valley tiles	3 7	per doz.
Best Broseley tiles	50 0	per 1,000 " "
Do. Ornamental Tiles	52 6	" " "
Hip and Valley tiles	4 0	per doz. " "
Best Ruabon Red, brown or brindled Do. (Edwards)	57 6	per 1,000 " "
Do. Ornamental Do.	60 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 0	" " "
Best Red or Mottled Staffordshire Do. (Peakes)	51 9	per 1,000 " "
Do. Ornamental Do.	54 6	" " "
Hip tiles	4 1	per doz. " "
Valley tiles	3 8	" " "
Best "Rosemary" brand plain tiles	48 0	per 1,000 " "
Do. Ornamental Do	50 0	" " "
Hip tiles	4 0	per doz. " "
Valley tiles	3 8	" " "

WOOD.

	At per standard. £ s. d.	£ s. d.	
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	15 10 0	16 10 0	
Deals: best 3 by 9	14 10 0	15 10 0	
Battens: best 2½ in by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 10 0	12 10 0	
Battens: best 2½ by 6 and 3 by 6	0 10 0	less than 7 in. and 8 in.	
Deals: seconds	1 0 0	less than best	
Battens: seconds	0 10 0	" "	
2 in. by 4 in. and 2 in. by 6 in.	9 0 0	" " 10 0	
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	9 10 0	
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0	more than battens.	
¾ in.	1 0 0	"	
Fir timber: Best middling Danzig or Memel (average specification)	At per load of 50 ft. 4 10 0	5 0 0	
Seconds	4 5 0	4 10 0	
Small timber (8 in. to 10 in.)	3 12 6	3 15 0	
Small timber (6 in. to 8 in.)	3 0 0	3 10 0	
Swedish balks	2 15 0	3 0 0	
Pitch-pine timber (30 ft. average)	3 5 0	3 15 0	
JOINERS' WOOD.	At per standard.		
White Sea: First yellow deals, 3 in. by 11 in.	23 0 0	24 0 0	
3 in. by 9 in.	21 0 0	22 10 0	
Battens, 2½ in. and 3 in. by 7 in.	17 0 0	18 10 0	
Second yellow deals, 3 in. by 11 in.	18 10 0	20 0 0	
" " 3 in. by 9 in.	17 10 0	19 0 0	
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	14 10 0	
Third yellow deals, 3 in. by 11 in. and 9 in.	15 10 0	16 10 0	
Battens, 2½ in. and 3 in. by 7 in.	11 10 0	12 10 0	
Petersburg: first yellow deals, 3 in. by 11 in.	21 0 0	22 10 0	
Do. 3 in. by 9 in.	18 0 0	19 10 0	
Battens	13 10 0	15 0 0	
Second yellow deals, 3 in. by 11 in.	18 10 0	19 10 0	
Do. 3 in. by 9 in.	16 0 0	17 0 0	
Battens	14 10 0	16 0 0	
Third yellow deals. 3 in. by 11 in.	11 0 0	12 10 0	
Do. 3 in. by 9 in.	13 10 0	14 0 0	
Battens	13 0 0	14 0 0	
White Sea and Petersburg:— First white deals, 3 in. by 11 in.	14 10 0	15 10 0	
" " 3 in. by 9 in.	13 10 0	14 10 0	
Battens	11 0 0	12 0 0	
Second white deals, 3 in. by 11 in.	13 10 0	14 10 0	
" " 3 in. by 9 in.	12 10 0	13 10 0	
" " battens	9 10 0	10 10 0	
Pitch-pine: deals	16 0 0	18 0 0	
Under 2 in. thick extra	0 10 0	1 0 0	
Yellow Pine—First, regular sizes	33 0 0	upwards.	
Oddments	22 0 0	24 0 0	
Seconds, regular sizes	24 10 0	26 10 0	
Yellow Pine Oddments	20 0 0	22 0 0	
Kauri Pine—Planks, per ft. cube	0 3 6	0 4 6	
Danzig and Stettin Oak Logs— Large, per ft. cube	0 2 6	0 3 6	
Small " "	0 2 3	0 2 6	
Wainscot Oak Logs, per ft. cube	0 5 0	0 5 6	
Dry Wainscot Oak, per ft. sup. as inch	0 0 7	0 0 8	
¾ in. do. do.	0 0 6½	—	
Dry Mahogany—Honduras, Tabasco, per ft. sup. as inch	0 0 9	0 0 11	
Selected, Figury, per ft. sup. as inch	0 1 6	0 2 0	
Dry Walnut, American, per ft. sup. as inch	0 0 10	0 1 0	
Teak, per load	17 0 0	21 0 0	
American Whitewood Planks— per ft. cube	0 4 0	—	
Prepared Flooring—	Per square.		
1 in. cy 7 in. yellow, planed and shot	0 13 6	0 17 6	
1 in. by 7 in. yellow, planed and matched	0 14 0	0 18 0	
1¼ in. by 7 in. yellow, planed and matched	0 16 0	1 1 6	
1 in. by 7 in. white, planed and shot	0 11 6	0 13 6	
1 in. by 7 in. white, planed and matched	0 12 0	0 14 0	
1¼ in. by 7 in. white, planed and matched	0 14 6	0 16 6	
¾ in. by 7 in. yellow, matched and beaded or V-jointed boards	0 11 0	0 13 6	
¾ in. by 7 in. do. do. do.	0 14 0	0 18 0	
1 in. by 7 in. white do. do.	0 10 0	0 11 6	
1 in. by 7 in. do. do. do.	0 11 6	0 13 6	

6-in. at 6d. to 9d. per square less than 7-in.

PRICES CURRENT (*continued*).

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.	£ s. d.
Rolled Steel Joists, ordinary sections	6 5 0 ...	7 5 0
Compound Girders, " "	8 2 6 ...	9 5 0
Angles, Tees and Channels, ordinary sections	7 17 6 ...	8 17 6
Flitch Plates	8 5 0 ...	8 15 0
Cast Iron Columns and Stanchions, including ordinary patterns	7 2 6 ...	8 5 6

METALS.

IRON—	Per ton, in London £ s. d.	£ s. d.
Common Bars	7 10 0 ...	8 0 0
Staffordshire Crown Bars, good merchant quality	8 0 0 ...	8 10 0
Staffordshire "Marked Bars"	10 10 0 ...	—
Mild Steel Bars	8 15 0 ...	9 5 0
Hoop Iron, basis price	9 5 0 ...	9 10 0
" " galvanised	17 10 0 ...	—
(*And upwards, according to size and gauge.)		
Sheet Iron (Black)— Ordinary sizes to 20 g.	9 15 0 ...	—
" " 24 g.	10 15 0 ...	—
" " 26 g.	12 5 0 ...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes—6 ft. by 2 ft. to 3 ft. to 20 g	12 15 0 ...	—
Ordinary sizes to 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 5 0 ...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	16 0 0 ...	—
" " 22 g. and 24 g.	16 10 0 ...	—
" " 26 g.	18 0 0 ...	—
Galvanised Corrugated Sheets— Ordinary sizes, 6 ft. to 8 ft. 20 g.	12 15 0 ...	—
" " 22 g. and 24 g.	13 5 0 ...	—
" " 26 g.	14 0 0 ...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	11 15 0 ...	—
Best Soft Steel Sheets, 22 g. and 24 g.	12 15 0 ...	—
" " " 26 g.	14 0 0 ...	—
Cut nails, 3 in. to 6 in.	9 5 0 ...	9 15
(Under 3 in., usual trade extras.)		

LEAD, &c.

	Per ton, in London. £ s. d.	£ s. d.
LEAD—Sheet, English, 3 lbs. and up	13 17 6 ...	—
Pipe in coils	14 7 6 ...	—
Soil pipe	16 17 6 ...	—
Compo Pipe	16 17 6 ...	—
ZINC—Sheet— Vieille Montagne ton	26 5 0 ...	—
Silesian	26 0 0 ...	—
COPPER— Strong Sheet per lb.	0 0 10½ ...	—
Thin "	0 0 11½ ...	—
Copper nails "	0 0 11 ...	—
BRASS— Strong Sheet "	0 0 10 ...	—
Thin "	0 0 11 ...	—
TIN—English Ingots "	0 1 3 ...	—
SOLDER—Plumbers' "	0 0 6 ...	—
Tinmen's "	0 0 8 ...	—
Blowpipe "	0 0 9 ...	—

ENGLISH SHEET GLASS IN CRATES.

15 oz. thirds	2d.	per ft. delivered
" fourths	1½d.	" "
21 oz. thirds	3d.	" "
" fourths	2½d.	" "
26 oz. thirds	3½d.	" "
" fourths	3d.	" "
32 oz. thirds	4½d.	" "
" fourths	4d.	" "
Fluted sheet, 15 oz.	2½d.	" "
" 21 oz.	3½d.	" "
⅛ Hartley's Rolled Plate	1¾d.	" "
⅛ " " "	2d.	" "
¼ " " "	2¼d.	" "

OILS, &c.

		£ s. d.
Raw Linseed Oil in pipes or barrels	per gallon	0 1 8
" " in drums	"	0 1 11
Boiled " " in pipes or barrels	"	0 1 11
" " in drums	"	0 2 2
Turpentine, in barrels	"	0 3 8
" in drums	"	0 3 10
Genuine Ground English White Lead	per ton	19 0 0
Red Lead, Dry	"	19 0 0
Best Linseed Oil Putty	per cwt.	0 7 6
Stockholm Tar	per barrel	1 12 0

VARNISHES, &c.

	Per gallon. £ s. d.
Fine Pale Oak Varnish	0 8 0
Pale Copal Oak	0 10 6
Superfine Pale Elastic Oak	0 12 6
Fine Extra Hard Church Oak	0 10 0
Superfine Hard-drying Oak, for seats of Churches	0 14 0
Fine Elastic Carriage	0 12 6
Superfine Pale Elastic Carriage	0 16 0
Fine Pale Maple	0 16 0
Finest Pale Durable Copal	0 18 0
Extra Pale French Oil	1 1 0
Eggshell Flatting Varnish	0 18 0
White Copal Enamel	1 4 0
Extra Pale Paper	0 12 0
Best Japan Gold Size	0 10 6
Best Black Japan	0 16 0
Oak and Mahogany Stain	0 8 0
Brunswick Black	0 8 6
Berlin Black	0 16 0
Knotting	0 10 0
French and Brush Polish	0 10 0

TO CORRESPONDENTS.

W. G. (Amounts should have been stated). M. T. W. (Below our limit).

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SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers) can ensure receiving "The Builder" by *Friday Morning's Post.*

PUBLISHER'S NOTICES.

Nat. Tel. 6112 Gerrard. Telegrams, "The Builder, London."

CHARGES FOR ADVERTISEMENTS.

COMPETITIONS, CONTRACTS, ALL NOTICES ISSUED BY CORPORATE BODIES, COUNTY AND OTHER COUNCILS, PROSPECTUSES OF PUBLIC COMPANIES, SALES BY TENDER, LEGAL ANNOUNCEMENTS, &c. &c.

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**** Stamps *must not* be sent, but all the sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," Catherine-street, W.C.

Advertisements for the current week's issue are received up to THREE o'clock p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after HALF-PAST ONE p.m. on that day. Those intended for the Outside Wrapper should be in by TWELVE noon on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

PERSONS Advertising in "The Builder" may have *Replies addressed to the Office*, Catherine-street, Covent Garden, W.C. *free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES, { NINEPENCE EACH. By Post (carefully packed) 1s.

TENDERS.

**** Owing to the Christmas holidays, the *Builder* will be published next week on Thursday instead of Friday. All communications for the Editor must therefore reach our office not later than 10 a.m. on Wednesday morning.
* Denotes *accepted.* † Denotes *provisionally accepted.*

ALLINGTON.—For rebuilding old inn, for Messrs. Gibbs, Mew, & Co. Messrs. John Harding & Son, architects, Salisbury:—

F. Dibben	£778 0 0	T. Stiles, South-ampton*	£527 18 0
Light & Son	745 0 0		
W. Quint Cole	738 0 0		
Wort & Way	699 17 9	Cockerill & Son	444 10 0

BELTON.—For erecting house and farm buildings for Mr. G. A. Maw. Mr. H. Kelsey, architect, Queen-street, Epworth:—

Basindale & Laggett	£851	T. Dawson, Epworth, Doncaster*	£659
W. Barton	826		
T. Bramford	764	E. Pearce	640
R. Stewart	734	Harrison & Leggett	622

BERWICK-ON-TWEED.—For the supply of whinstone, for the Sanitary Authority:—

	s.	d.	
M. Appleby, Embleton, Northumberland.....	10	11	per ton mashed rubble.
	16	5	„ „ 5×10 kerb.
	15	5	„ „ 6×5 flats.

BRANDON.—For water-supply works (contract No. 1), for the Rural District Council. Messrs. H. Walker & Son, engineers, Albion Chambers, King-street, Nottingham:—

Farren & Son	£5,264	0	0	J. G. Cowell ...	£3 733	0	0
Boughton & Sons	4.590	10	0	H. Shardlow ...	3,700	0	0
H. Ashley	3.995	0	0	Davies, Ball, & Co.	3,615	0	0
Jenkins & Son	3,923	0	0	J. H. Vickers, Ltd., Nottingham* ...	3 520	0	0
J. F. Price.....	3,900	0	0				
F. Pattinson...	3,865	15	0				
Hutchinson & Son.....	3,800	0	0	Langley & Westmoreland.....	3.461	4	4
Ernest West ...	3,793	0	0	F. C. Thurman	3,449	0	0
T. Barlow	3,777	2	6				

BRANDON.—For water supply works (Contract No. 2), for the R.D.C. Messrs. H. Walker & Son, engineers, Albion-chambers, King-street, Nottingham:—

F. Bradley £1,032	15	7	Clay Cross Co....	£871	13	9
Birtley Iron Co.	953	7	0	Biggs, Wall, & Co.	854	9	6
Cochrane & Co.	923	15	9	Watson, Gow, & Co, Ltd.	850	0	9
Stevenson & Co.	894	18	7	Oakes & Co., Ld.	850	0	0
Butterley Co., Ltd.....	890	12	6	Sheepbridge Coal & Iron Co.....	848	12	4
J.S. Roberts, Ld.	886	0	0	A. G. Cloate	820	17	3
Stanton Iron Co., Ld.....	879	14	7	Staveley Coal & Iron Co., Ld., Chesterfield*..	817	4	11
Holwell Iron Co., Ltd.....	873	2	7				

BRENTFORD.—For making up Clifden-road, for the Urban District Council. Mr. Nowell Parr, Surveyor, Clifden House, Boston-road, Brentford:—

Barry	£874	0	0	Mowlem & Co....	£721	0	0
J. Ball	860	0	0	Neave & Son ...	713	0	0
London County Builders.....	833	14	0	Lamble	679	0	0
				Nowell & Co. ...	679	0	0
Morecroft.....	795	0	0	Watson	654	6	3
W. Parker.....	794	0	0	Wheeler, Southwark	579	0	0
Lawrence & Thacker.....	725	0	0				

[Surveyor's estimate, £700.]

CARNARVON.—For gymnasium at County School, for the Carnarvon Local Governing Body. Mr. R. Lloyd Jones, County Architect, 14, Market-street, Carnarvon:—

Roberts & Bro.	£855	Williams & Roberts, Carnarvon*	£618
Edward Parry	645		

CHESTER-LE-STREET.—For making-up private streets, Chester-le-Street, Durham, for the R.D.C. Mr. G. W. Ayton, Highway Surveyor, Chester-le-Street. Quantities by Highway Surveyor:—

R. Gardiner ...	£3,549	10	5	G. Wells.....	£1,349	1	6
Hardy & Atkinson	2,562	12	6	J. Carrick	1,304	2	1
				J. McMalaren	1,288	16	9½
J. W. White ...	1,558	1	2	Thompson & Son, Chester-le-Street* ...	1,279	13	11
Catherall & Co.	1,409	6	1				
C. Groves	1,374	4	4				
G. E. Simpson	1,366	4	11				

[Surveyor's estimate, £1,371 18s. 7d.]

CLONMEL (Ireland).—For two artisans' and ten labourers' dwelling houses, for the Corporation. Mr. James J. M'Auley, architect:—

Lonergan & Bros.	£1,280	18	6	James Boles, Clonmel‡ ...	£1,498	10	0
Cleary & Sons	1,550	0	0				

‡ Recommended for acceptance.

CROYDON.—For constructing two relief stations in Church-road and Sanderstead-road respectively, for the Croydon Guardians. Messrs. Wills & Anderson, architects, 4, Adam-stret, Adelphi:—

	Church-road.	Sanderstead-road.
Leonard & Mason	£1,275	..... £1,334 0
Williams & Son	1,160	..... 1,220 0
T. Peace	1,050	..... 1,050 0
Smith & Sons	975	..... 1,140 0
Robson & Moon	960	..... 992 16
A. W. Grace	912	..... 1,125 0
C. Jackson.....	899	..... 999 0
G. E. Everett	897	..... 982 0
T. R. Young	889	..... —
D. W. Barker, Croydon*...	829	..... 915 0
[Architect's probable estimate.....	832	..... 950 0

DEVONPORT.—For taking down old buildings, and erecting new printing works, for Messrs. W. G. Swiss & Son. Mr. E. M. Leest, architect, 14, St. Aubyn-street, Devonport. Quantities by Messrs. Leest & Adams, surveyors, Devonport:—

Littleton & Son ...	£539	0		A. Sleeman	£469	0
F. Watts	514	2		H. Hanbury	465	0
Smith & Son	499	15		Jenkin & Son*	453	0
A. H. Northcott ...	483	0				

DEVONPORT.—For alterations to the Jubilee Inn, Fore-street, Torpoint. Mr. E. M. Leest, architect, 14, St. Aubyn-street, Devonport. Quantities by Messrs. Leest & Adams, Devonport:—

Smith & Son ...	£319	15	0	R. Kent.....	£2?7	13	10
G. F. Kingdom	250	16	7	S. E. D. Ough, Saltash*	214	0	0
Snell & Son	230	0	0				

DEVONPORT.—For altertions to The Half Moon Inn, George-street, Devonport, for the Plymouth Breweries, Limited. Mr. E. M. Leest, architect, Devonport. Quantities by Messrs. Leest & Adams, Devonport:—

Taylor & Son.....	£490	0	Smith & Son, Devonport*	£371	15
Blackell & Son	421	0			
Pearn Bros.	397	0			

DEVONPORT.—For alterations to the Rose and Crown p.h., Pembroke-street, Devonport, for Messrs. Ash & Son. Mr. E. M. Leest, architect:—

T. May, Plymouth	£441 15

HALTWHISTLE (Northumberland).—For erecting Board room and offices, for the Guardians. Mr. J. M. Clark, F.S.I., Haltwhistle:—

W. Strachan, Haltwhistle*	£1,325 10

HARDINGSTONE.—For construction of a sewage tank, Mill-road outfall, Cogenhoe, for Hardingstone R.D.C. Messrs. Sharman & Archer, architects and surveyors, Wellingborough:—

Seddons & Freeman	£316	0	W. Wright £278	0	
W. G. Wilmott	310	0	Brown & Sons	260	0
W. Smart	295	10	J. C. Sharman, Cogenhoe*	247	0
H. Clayson	289	0			
A. T. Chown	285	0			

ILFORD.—For levelling, metalling, &c., roads, for the U.D.C. Mr. H. Shaw, A.M.Inst.C.E., Surveyor to the Council, Town Hall, Ilford:—

D. T. Jackson, 104, Ripple-road, Barking.	£188	1	8	Brisbane-road.
	211	1	3	Dunedin-road.
	283	6	2	Thorold-road.
	463	11	8	Seven Kings'-road.

LIMPSFIELD.—For additi ns and alterations to Stoneshill, Limpsfield, Surrey, for Mr. F. O. Osmaston. Messrs. Wills & Anderson, architects, 4, Adam-street, Adelphi, London. Quantities by Messrs. J. Leaning & Sons, 28, John-street, Bedford-row, W.C.:—

George Wade.....	£3.886	John Brazier	£2,977
Maides & Harpur ...	3,417	Strange & Sons, Tunbridge Wells*	2,926
Henry Young	3,014		

[Surveyor's probable estimate, £2,975.]

LONDON.—For the erection of Cubitt Town library building, for the Poplar Borough Council:—

A. J. Sheffield	£6,134	0	0	Patman & Fotheringham, Ltd. ...	£5,223	0	0
Sabey & Son ...	5,715	0	0				
Thomas & Edge	5,614	0	0				
Wm. Downs ...	5,570	0	0	Lawrence & Co.	5,277	0	0
Geo. Sharpe ...	5,516	16	0				
Sharpington ...	5,452	0	0	Jas. Parsons...	5.258	0	0
Moss & Co. ...	5,425	0	0	Chas. Gray Hill	5,253	0	0
Spencer, Santo, & Co., Ltd....	5,334	0	0	Foster Bros. ...	5,248	0	0
				Ferguson & Co.	5,120	0	0
H. Lovatt	5,270	0	0	Nightingale ...	5,068	0	0
Somerford & Son	5,233	0	0	Roome & Co....	4,987	0	0
				A. Faulks	4,815	5	5
				Watts-Johnson & Co.*.....	4,796	0	0

LONDON.—For alterations and fitting up premises, 15, New Broad-street, E.C., as a hair dressing saloon, for Mr. Stewart Anderson. Mr. Walter Graves, architect, Winchester House, Old Broad-street, E.C.:—

Sumner & Co.	£479	Little & Senecal, Hatton-wall, E.C.*.....	£379
Spencer, Santo, & Co...	459		
Styles & Son	379		

LONDON.—For making up the roadways and paving footways of Hornshay-place, Sarah-place, and Tolhurst-street, for Deptford Borough Council:—

J. E. Etheridge, 8a, Rollins-street, Old Kent-road, S.E.	Hornshay-place	£119	13 0
	Sarah-place.....	117	0 6
	Tolhurst-street	163	11 6

LONDON.—For erecting library buildings, Cubitt Town, for the Borough Council. Mr. C. H. Norton, architect, 14, Bedford-row, W.C. Quantities by Mr. Henry Theobald, F.S.I., 6, South-street, Finsbury-pavement, E.C.:—

	Amount of Tender.	Monk Park Bath Stone for Terra Cotta.	Bradford's Grano-Concrete for Coke Breeze Concrete, Floors and Flats.	Bradford's Grano-Concrete for Artificial Stone Stairs, &c.
		Deduct	*Add*	*Add*
	£	£ s. d.	£ s. d.	£ s. d.
A. Faulkes	4,950	134 14 7	224 3 8	3 0 0
Watts-Johnson, & Co.	4,967	171 0 0	237 0 0	4 0 0
				Deduct
Roome & Co.	4,998	11 0 0	280 0 0	3 0 0
Ferguson & Co.	5,120	—	208 5 6	—
				Add.
B. E. Nightingale	5.218	150 0 0	275 0 0	9 0 0
		Add		
C. Gray Hill	5,223	30 0 0	290 0 0	3 0 0
Foster Bros.	5,248	—	247 0 0	13 0 0
		Deduct		
Lawrence & Son	5,297	20 0 0	258 0 0	—
				Deduct
J. Parsons	5,318	60 0 0	278 0 0	11 0 0
				Add
Patman & Fotheringham, Ltd.	5 323	100 0 0	270 0 0	4 0 0
Somerford & Son	5,328	95 0 0	271 0 0	7 0 0
			Deduct	
H. Lovatt	5,440	179 0 0	11 0 0	15 0 0
			Add	*Deduct*
Spencer, Santo & Co., Ltd.	5,500	136 0 0	282 0 0	5 0 0
T. G. Sharpington	5,588	136 0 0	243 0 0	—
			Deduct	
G. Sharp	5,590	83 4 0	243 17 5	24 17 6
			Add	*Add*
W. Downs	5,680	110 0 0	295 0 0	8 0 0
Thomas & Edge	5 732	118 0 0	303 0 0	6 0 0
Moss & Co.	5,750	325 0 0	262 0 0	—
Sabey & Son	5,820	105 0 0	315 0 0	12 0 0
				Deduct
A. J. Sheffield	6,381	247 0 0	211 0 0	12 10 0

LONDON.—For Hampstead Hospital. Messrs. Young & Hall, architects:—

Order if Portland Stone.	Name.	Carcase.	Finishings.	Boundary Walls, &c.	Total.	Deduct if Victoria Stone.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1.	Wm. Willett.....	14,660 0 0	15,025 0 0	902 0 0	30,587 0 0	610 0 0
2.	Holloway Bros.	13,246 0 0	15,766 0 0	1,058 0 0	29,870 0 0	122 0 0
3.	Leslie & Co.....	12,966 0 0	15,043 0 0	1,019 0 0	29,028 0 0	264 0 0
4.	C. Brightman	13,069 17 0	14,790 0 0	1,050 0 0	28,909 17 0	555 0 0
5.	Knight & Son	13,411 0 0	14,513 0 0	942 0 0	28,866 0 0	351 0 0
6.	S. J. Scott.....	12,910 0 0	14,929 0 0	1,024 0 0	28,863 0 0	322 0 0
7.	W. Downs.....	12,738 0 0	14,811 0 0	993 0 0	28,542 0 0	220 0 0
8.	Ferguson & Co.	12,960 0 0	14,400 0 0	1,137 0 0	28,497 0 0	674 10 3
9.	Pattinson & Sons	12,890 0 0	14,631 0 0	909 0 0	28,430 0 0	65 0 0
10.	C. Ansell	12,775 0 0	14,660 0 0	971 0 0	28,406 0 0	255 0 0
11.	Holliday & Greenwood...	12,577 0 0	14,861 0 0	933 0 0	28,371 0 0	312 0 0
12.	B. E. Nightingale	12,399 0 0	14,866 0 0	999 0 0	28,264 0 0	164 0 0
13.	Lawrence & Son.....	12,449 0 0	14,695 0 0	1,005 0 0	28,149 0 0	316 10 0
14.	Gough & Co.....	12,700 0 0	14,440 0 0	900 0 0	28,040 0 0	140 0 0
15.	W. Whitehead.....	12,235 0 0	14,780 0 0	950 0 0	27,965 0 0	198 0 0
16.	G. Henson.....	12,622 4 0	14,459 8 9	877 3 0	27,958 15 9	392 10 0
17.	H. Martin.....	12,385 0 0	14,530 0 0	862 0 0	27,777 0 0	309 0 0
18.	J. & M. Patrick	12,600 0 0	14,000 0 0	870 0 0	27,470 0 0	227 0 0
19.	Patman & Fotheringham	12,227 0 0	14,273 0 0	900 0 0	27,400 0 0	250 0 0
20.	Kerridge & Shaw	11,688 0 0	14,373 0 0	978 0 0	27,039 0 0	234 10 0
21.	Perry Bros.	11,997 0 0	13,897 0 0	1,127 0 0	27,021 0 0	237 0 0
22.	Godson & Sons	11,198 0 0	13,881 0 0	924 0 0	26,003 0 0	232 0 0

[See also page 64.

CONTRACTS AND PUBLIC APPOINTMENTS.

(For some Contracts, &c., still open, but not included in this List, see previous issues.)

CONTRACTS.

Nature of Work or Materials.	By whom Advertised.	Forms of Tender, &c., supplied by	Tenders to be delivered
*Heating & H.-W. Supply Apparatus, &c. Southern Hos.	Metropolitan Asylums Board	Office of the Board, Embankment, E.C.	Dec. 18
Sewering, Paving, &c., Vernon-street, Moston	Manchester Corporation	Surveyor's Office, Town Hall, Manchester	Dec. 21
Paints, Oils, Varnish, &c.	Cardiff Corporation	J. Woosey, Town Hall, Cardiff	do.
Steel Footbridge over Canal, Copley	Halifax Corporation	J. Lord, Civil and Borough Engineer, Town Hall, Halifax	do.
Excavators' and Masons' Work for Footbridge, Copley	do.	do.	do.
Pipes, &c., for Waterworks	do.	R. J. Hartley, A.M.Inst.C.E, Waterworks Eng., Gibbet-st., Halifax	do.
Wood Benches,, &c., Offices & Wkshops, Springwell-st.	Street Lighting Department	City Engineer's Office, Municipal Buildings, Leeds	do.
Gymnasium Fittings, Moorfield-road, Armley	Leeds Corporation	do.	do.
Gymnasium Fittings. Western Flatts Pk., L. Wortley	do.	do.	do.
Portswood Schools, &c.	Southampton Corporation	Borough Engineer's Office, 123, High-street, Southampton	do.
Villa, Hough-lane, Wombwell	H. S. Winter	J. Robinson, Architect, Park Cottage, Wombwell	do.
Making-up Grafton-road-lane, &c.	Plymouth Corporation	J. Paton, Borough Engineer, Municipal Offices, Plymouth	do.
Reading-Room, Ebchester	.....	W. T. Spence, Architect and Surveyor, Shotley Bridge	do.
300 tons Road Metal	Dumbarton Corporation	J. Briggs, Borough Surveyor, Dumbarton	do.
680 yards Pipe Sewers, &c., Farnley, Corbridge	Hexham R.D.C.	J. E. Parker, Civil Engineer, Post Office Chambers, Newcastle-on-T.	Dec. 22
Tank and Filters for Sewage Disposal, Farnley	do.	do.	do.
250 tons of Cast-Iron Pipes	Horwich U.D.C.	P. Taberner, Clerk to Council, Council Offices, Horwich	do.
Roofing over Loading Mound, Goods Depot, Liverpool	Lancs and Yorks Railway	Engineer's Office, Hunt's Bank, Manchester	do.
Furniture, Kingseat Asylum	.....	C. B. Williams, Clerk to District Board, 20, Union-terrace, Aberdeen	do.
Master's House, Cwmystwyth	Llanfihangel-y-Croyddin U.Bd.Sch.	J. A. Jones, Architect, 7, Queen's-terrace, Aberystwyth	do.
Alterations, St. George's Hall, Bridlington	J. Taylor	J. Earnshaw, Architect, Carlton House, Bridlington	do.
Tea House, Collins Fields	Harrogate Corporation	F. Bagshaw, Borough Engineer, Municipal Offices, Harrogate	do.
Iron, Steel, Fireclay Goods, &c., at Gasworks	Halifax Corporation	J. Wilkinson, Engineer, Gasworks, Halifax	Dec. 23
Stores and Materials	Handsworth U.D.C.	H. Richardson, A.M.Inst.C.E., Sur. to Coun., C. House, Handsworth	do.
Labourers' Cottages, &c., Lusk, Dublin	Balrothery R.D.C.	A. Scott, Civil Engineer, 34, Lower Sackville-street, Dublin	do.
Additions to Workhouse, St. Austell	St. Austell Guardians	J. Mutton, Architect, Charlestown, St. Austell	do.
Stand, Tattersall's Enclosure, Brighton Racecourse	Brighton Borough	F. J. Tillstone, Town Clerk, Brighton	do.
*New Stand, Brighton Racecourse	Brighton Borough Council	Town Clerk, Town Hall, Brighton	do.
72 tons of Oxide of Iron, &c.	Wilmslow & Alderley Edge Gas Co.	W. Severs, Engineer, Gasworks, Wilmslow	do.
Street Works, Adwick-road and Spencer-street	Swinton U.D.C.	R. Fowler, Surveyor, Council Offices, Swinton, Rotherham	do.
Deepening Well	do.	do.	do.
Steam Mains, Workhouse, Selby Oak	Guardians, King's Norton Union	T. B. Hall & Jones, Engineers, King's Court, Colmore-row, Bir'ham	do.
New Streets, Bradley-crescent, &c.	Barton Regis R.D.C.	J. A. Henderson & H. H. Howell, Coun. Offices, Westbury-on-Trym	do.
Dwelling House, Luck-lane, Marsh	.....	P. Taylor & Co., Architects, Central Buildings, Milnsbridge	Dec. 24
Galvanised Engine-Shed at Detritus Chambers	Rugeley U.D.C.	W. E. Rogers, Surveyor, Anson-street, Rugeley, Staffs	do.
Stores	Wingate Grange Colliery	W. Fleetham, Cashier, Wingate Grange Colliery	do.
Colliery Stores	Owners of Colliery	Garforth Colliery, near Leeds	do.
Cottage, Dairy, &c., Inverailout	Mrs. Head	L. & J. Falconer, Architects, Fort William	Dec. 25
Church, Hodge-street, Falkirk	Committee, Eskirne A.F. Church	A. & W. Black, Architects, Falkirk	Dec. 26
School Furniture and Fittings, Heworth Jnr. Schools	Fellings Education Committee	G. Bolam, Council Buildings, Felling, R.S.O., Durham	do.
Stores	Alliance &c. Consumers Gas Co.	F. T. Cotton, Secretary, D'Olier-street, Dublin	Dec. 27
Twenty-four Houses	Stanley U.D.C.	W. Forster, Architect, Front-street, Stanley	Dec. 28
Cast-Iron Pipe Cover, &c., Clapham-road, Bedford	Bedford Corporation	N. Greenshields, Borough Engineer, Town Hall, Bedford	do.
Alterations, Lochmaddy Public School	Forth Uiss School Board	R. F. Matheson, Claddach, Kirkibost, Lochmaddy	do.
*Street Works	Droylsden U.D.C.	Council's Surveyor, 10. Ashton-road, Droylsden	do.
Street Works, Buxton-lane, Droylsden	U.D.C.	C. Hall, Surveyor to Council, 10, Ashton-road, Droylsden	do.
Underground Convenience, Cheriton-street	Cheriton U.D.C.	Surveyor's Office, Public Offices, Cheriton, Kent	do.
Diversion and Culverting of Fallowfield Brook	Manchester Corporation	City Surveyor, Town Hall, Manchester	do.
Private Improvement Works, June-street	Bootle Corporation	Borough Engineer's Offices, Bottle...	Dec. 29
Taking Down House, Ebor Villas, &c.	Tramways Com. Salf'rd Corporation	Borough Engiuer, Town Hall, Salford	do.
Subway, Beaumaris Pier	.....	R. Lloyd, Pier Gates, Beamaris	Dec. 30
Warehouse and Offices, Beaumaris Pier	.....	do.	do.
Outside Fire Escape Staircases, Upton Asylum, Chester	Asylum Visitors	H. Beswick, County Architect, Newgate-street, Chester	do.
Iron nongery, Castings, &c.	Corporation of Oxford	City Engineer's Office, Town Hall, Oxford	do.
Roadmaking Machinery	Tipperary County Council	County Surveyor, Court House, Nenagh, Ireland	do.
Separation Wards at Workhouse	Farnham Guardians	Friend & Lloyd, Architects, Grosvenor-road, Aldershot	do.
Underground Conveniences	Working U.D.C.	G. J. Wooldridge, Surveyor, Bank Chambers, Woking	do.
Flooring Schoolroom, Worehouse, Sundridge	Sevenoaks Guardians	G. F. Carnell, Clerk to Guardians, Sevenoaks	do.
District Library, Bridgeton	Glasgow Corporation	J. Ritchie, 180, West Regent-street, Glasgow	do.
Nurses' Home Married Couples Quarters, &c.	Stafford Guardians	H. T. Sandy, Architect, Stafford	Dec. 31
Alterations and Additions to Lent Hill, Ashburton	Hon. R. Dawson	F. W. Vanstone, Architect, Palace Chambers, Paington	do.
Two Small Buildings at Gasworks	Devonport Corporation	S. E. Stevenson, Engineer, Gasworks, Devonport	do.
Six Houses, Castlebrook	F. A. Guy, J.P.	J. M. Robinson, Architect, 7, East Wall, Londonderry	Jan. 1
Coastguard Station, Herne Bay	.....	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
Forming, &c., Cross-streets, Kelloe	Coxhoe Parish Council	M. H. Seymour, Clerk's Office, Main-street, Kelloe	do.
*Sewerage and Surface Water Drainage Works	Walmer U.D.C.	Beesley, Son, & Nichols, 11, Victoria-street, S.W.	do.
•Filtering Tank and Sludge Beds, Enfield	Cheshunt U.D.C.	Council's Clerk, U.D.C. Offices, Manor House, Chesthunt, Herts	do.
*Coastguard Station at Herne Bay	The Admiralty	Works Department, Admiralty, 21, Northumberland-avenue, W.C.	do.
*New Portswood Schools	Southampton Corporation	Borough Engineer, 123, High-street, Southampton	Jan.
Free Library Building, Lurgan, Ireland	Lurgan U.C.	H. Hobart, Architect, Dromore, County Down	do.
Extension of Trinity Hall, Ton-y-pandy	.....	R. S. Griffiths, Architect, Excelsior, Buildings, Ton-y-pandy	do.
Roofs and Supports, &c., to Market (three Contracts)	Neath Corporation	D. M. Jenkins, A.M.Inst.C.E. Gwyn Hall, Neath	do.
Main Drainage Works (Marton Beck Sewer)	Middlesborough Corporation	F. Baker, Civil Engineer, Borough Engineer, Middleborough	do.
•Goods Shed, St. Austell Station, Cornwall	G.W.R. Co.	The Engineer, Plymouth Station	Jan. 5
Fifteen-ton Steam Roller	East Ham U.D.C.	A. H. Campbell, A.M.Inst.C.E., Town Hall, East Ham, E.	do.
550 Lineal yards of 9 in. Stoneware Sewer, &c., Toft-rd.	Bucklow R.D.C.	J. M'D. M'Kenzie, Engineer & Surveyor, 7, Market-st., Altrincham	do.
Iron Castings	Bury Water Board	R. B. Rigby, Waterworks Manager, Parson's-lane, Bury, Lancs	do.
* Taking down Church &Bdg. New Church, Whitehaven	.....	J. S. Moffat, Architect, 53, Church-street, Whitehaven	do.
Timber Wharf, 750 ft. long, &c., River Dee	Aberdeen Harbour Commissioners	R. G. Nicol, Harbour Engineer's Office, Aberdeen	Jan. 6
Deeping Harbours, Constructing Breakwater, &c.	St. Monan's Harbour Commissioners	D. & C. Stevenson, Civil Engineer, 84, George-street, Edinburgh	do.
•Lunatic Wards at Whipp's Cross-road, Leytonstone	West Ham Union	Clerk's Office, Union Workhouse, Leytonstone, N.E.	do.
Collection and Removal of House Refuse	Hambledon R.D.C.	F. Smallpiece, Clerk, 138, High-street, Guildford	Jan. 11
Refuse Destructor & Electric Light Bdgs., Cambuslang	Lanark County Council	W. L. Douglas, Civil Engineer, District Offices, Hamilton N.B.	do.
Brick Chimney Stalk, 100 ft. high, at Wellshot	do.	do.	do.
*Carnegie Library at Manor Park	East Ham U.D.C.	Engineer and Surveyor to the Council, Town Hall, East Ham	do.
*Annual &c., Contrrcts	Borough of Wandsworth	Town Clerk, Council House, Wandsworth, S.W.	do.
*Extension of Workhouse, Harrow-road	Paddington Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-street, S.W.	Jan. 12
*Two Iron Fire Escape Staircases at Workhouse	do.	E. Howley Sim, Architect, 8, Craigs Court, Charing Cross, W.C.	do.
7,100 yds. Concentic Armoured Cables, &c.	Borough of Camberwell	J. A. Crowther, E.E., Electric Supply Works, Sea View-rd., Liscark	Jan. 16
*Annual Contracts	Wallasey U.D.C.	Borough Engineer, Town Hall, Camberwell, S.E.	Jan. 19
Electric Power Plant	Enniscorthy District	H. J. Harris, Consulting Engineer, 30, Parliament-street, Dublin	Jan. 20
*Additions, &c., to Victoria Hall	Sunderland Corporation	J. Eltringham, Architect, 62, John-street, Sunderland	Feb. 1
Additions and Alterations to Victoria Hall	Sunderland Corporation	do.	do.
Electric Installation	Corporation of Irvine	J. Dickie, Town Clerk, Irvine, N.B.	No date.
Cooperative Premises and Alterations, New Br ompton	Carlisle South EndCo-operative Soc.	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	do.
New Ward & Alterations, Kent & Canterbury Hospital	.....	W. J. Jennings, Architect, St. Margarte's-street, Canterbury	do.
Furniture, Kingseat Asylum	.....	C. B. Williams, Clerk to District Board, 20, Union Terrace, Aberdeen	do.
Elec. Light, Tynemth Vic. Jubilee Infirmy., N. Shields	.....	J. W. Meadows, Secretary, 43, Howard-street, N. Shields	do.
*Buildings for New Printing Works, N. Kensington	Messrs. Lane Bros., Ltd.	W. Daniel, Architect, 61, Lydford-road; Paddington, W.	do.
50 tons Flanged Rails, &c.	.....	Secretary, Hoyland Silkstone Coal & Coke Co., Hoyland, Barnsley	do.
Sinking a Shaft	Sanfield Lea Colliery	The Company, Shield Row Station	do.

[See also next page.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in
Manager for Sewage Farm, Irthlingborough Grange ...	Wellingborough U.D.C.	125*l.* &c.	Dec. 22
*Assistant Examiners in Patent Office	Civil Service Commissioners	Not stated	do.
*Executive Engineer (Public Works Dept.)	Hong-Kong	480*l.* &c.	Dec. 24
*Assistant Engineer (Public Works Dept.)	do.	360*l.* &c.	do.
Art Teacher	Cork Technical Instruction Comm.	120*l.*, with expenses	Jan. 1
*Valuer and Surveyor (Valuation Office, Ireland)	Civil Service Commissioners	Not stated	Jan. 28
*Civil Engineering Draughtsman	The Admiralty	Not stated	No date.

Those marked with an asterisk (*) are advertised in this Number. *Contracts*, Iv. vi. viii. & x. *Public Appointments*, lxvii.

TENDERS (*continued*):—

LONDON.—For new branch library at Lower Sydenham, for the Public Library Committee, Lewisham:—

T. G. Thaysington	£5,358	Leney & Sons	£4,425
Chessum & Sons	4,991	F. Athey	4,411
Roberts & Co.	4,819	R. & E. Evans	4,387
Charles North	4,815	J. Renwick	4,386
Creaton & Co.	4,775	H. Heathfield	4,383
Godson & Sons	4,690	G. Parker	4,345
T. D. Leng	4,620	Henry Kent	4,333
Staines & Son	4,593	Ferguson & Co.	4,310
Smith & Sons	4,591	Bullock & Co.	4,305
J. & C. Bowyer	4,547	Jerrard & Sons	4,283
Patman & Fotheringham	4,523	Appleby & Son	4,264
B. E. Nightingale	4,473	F. W. Green	4,242
Whitehead & Co.	4,460	Foster Bros.	4,180
Enness Bros.	4,440	Chas. Jackson	4,141
H. L. Holloway	4,432	W. Wallis	4,079
		Perry Bros., City-rd.*	4,027

MERTHYR.—For rebuilding No. 15, High-street, Merthyr, for Mr. H Davies Butcher, Merthyr. Mr. Charles M. Davies, architect and surveyor, 113, High-street, Merthyr Tydfil:—

J. Williams	£2,293 0 0
Shepton & Sons	2,197 0 0
J. Jenkins, Canal Wharf, Merthyr	2,130 6 6

MIDDLESBROUGH.—For alterations to stables, Local Board Yard, for the Middlesbrough Corporation. Mr. Frank Baker, Borough Engineer:—

Allison Bros.	£250 0 0	Bastiman Bros.	£235 0 0
Doughty & Sons	238 0 0	B. Crisp	226 6 10
Hudson Bros.	237 0 0	Vintner & Davison*	226 0 0
H. Walker	236 0 0		

[Borough Engineer's estimate, £226.]

RADCLIFFE.—For butcher's premises and manager's house, for the Co-operative Society. Mr. J. G. Crone, architect, 26, Cloth Market, Newcastle-on-Tyne:—

J. McEwan	£2,635 19	A. Douglas	£1,170 0
Gordon Bros.	1,327 15	Elliott Bros.	1,167 0
R. & G. Brown	1,248 0	Carse & Son	1,142 0
Braithwaite & Co.	1,243 0	W. S. Anderson	1,118 9
W. C. Tyrie	1,189 0	T. B. Shilling, Sunderland*	1,064 0
R. Brown	1,180 0		

RATHFARNHAM (County Dublin).—For road making and other works, for the South Dublin Rural District Council. Mr. T. J. Byrne, Surveyor to the Council, 1, James'-street, Dublin:—

G. P. Walsh	£348
T. Reilly, 41, Rutland-square, W., Dublin*	£271

RAUNDS (Northants).—For sinking well, for the Raunds Urban District Council. Mr. Thos. Yorke, engineer and surveyor, Raunds:—

Trial Well.

Joseph Smalley	£2,036	John Crompton	£745
J. F. Price	1,640	Geo. Chesswas	571
Chas. Chamberlain	1,419	W. Smart	497
Thos. Adams	1,315	Wm. Crossland	461
Barnes & Sharpe	865	Tanner Bros., Raunds*	275
Walter Barrick	865		

[Surveyor's estimate, £475.]

Trial Boring.

J. F. Price	£742	Wm. Antrobus	£421
Timmins & Son	600	Le Grand & Sutcliffe	405
Matthews & Co.	590	Potter & Co	397
Geo. Chesswas	574	Joseph Smalley	360
Duke & Ockenden	562	J. Wallis Fitt	319
Chapman & Sons	562	Wallace A. Ockenden	312
Thos. Matthews	499	Isler & Co.	312
Vivian's Boring & Exploration Co.	497	Bacon Air-Lift Co.	308
Brown & Co.	451	John Thom	308
Cheeld & Co.	442	J. J. Hymes	285
Barnes & Sharpe	423	J. E. Noble, Bowen, E.*	261

[Surveyor's estimate, £350.]

RISCA (Mon.).—For the erection of a church mission room and school, Pontymister. Mr. E. N. Johnson, architect, Risca. Quantities by architect:—

Scheme 1.

C. Lock, Newport, Mon.	£1,789
J. Charles, Newport, Mon.	1,763
E. C. Jordan, Newport, Mon.	1,750
C. H. Reed, Newport, Mon.	1,658
J. Pritchard, Pontymister, Mon.	1,542

[Accepted scheme.]

Scheme 2.

C. Lock	£1,475
C. H. Reed	1,391
E. C. Jordan	1,387
J. Charles	1,367
J. Pritchard	1,250

Boundary Walls and Footways.

E. C. Jordan	£220
C. Reed	217
J. Charles	200
C. Lock	198
J. Pritchard	175

ROCHESTER.—For alterations to central tower, Rochester Cathedral. Mr. C. Hodgson Fowler, F.S.A., architect, The College, Durham. Quantities by Mr. Geo. R. Boreham, Sunderland:—

G. Gates	£9,335	Bowman & Son	£6,000
Shillitoe & Son	7,950	Thompson & Co.	5,886
J. D. Corke	7,860	West Bros.	5,782
C. E. Skinner	7,663	S. F. Halliday, Stamford*	5,292
Wallis & Sons	6,776		
R. Bridgeman	6,108		

RYTON.—For an outfall sewer at Addison, for U.D.C. Mr. J. P. Dalton, Surveyor to the Council, Ryton:—

Jas. McEwan	£192 13 5	W. A. Armstrong	£116 1 1
M. H. Nicholson	149 19 11½	McLaren & Son, Gosforth*	115 5 6
Walter Craig	120 9 9		

[Surveyor's estimate, £120.]

SENGHENYDD (Wales).—For the erection of a Baptist chapel and schools, for the English Baptist Church. Mr. Harry Snell, architect, Penarth:—

D. C. Jones	£2,825	George Haywood	£2,414
John Wood	2,712	Richard Jones, Abertridwr*	1,995
W. J. Morgan	2,500		

SOUTHEND-ON-SEA.—For the execution of street works, &c., Salisbury-avenue, for the Corporation. Mr. E. J. Elford, C.E., Town Hall, Southend-on-Sea:—

Salisbury-avenue.

G. Bell	£2,194	W. Iles	£1,680
E. T. Bloomfield	1,931	Buxton & Jenner	1,638

[Borough Engineer's estimate, £1,721.]

SOUTH TOTTENHAM.—For alterations and additions to the hot-water supply apparatus at the North-Eastern Hospital, South Tottenham, for the Metropolitan Asylums Board:—

W. Reason	£949 0 0
Tamplin & Makovski, Ltd.	923 0 0
Thomas & Taylor, Ltd.	920 0 0
Benham & Sons, Ltd.	865 0 0
Wenham & Waters, Ltd.	794 0 0
Russell & Co.	670 0 0
Beaven & Sons	665 0 0
R. H. and J. Pearson, Ltd.	650 0 0
Cannon & Sons	625 0 0
Stubbs, Alexander, Ltd.	590 0 0
Richmond & Co., Ltd.	564 0 0
Brightside Foundry & Engineering Co., Ltd.	541 10 0
Werner, Pfleiderer, & Perkins, Ltd.	499 17 0
G. & E. Bradley	497 0 0
W. Freer	487 10 0
Rosser & Russell, Ltd.	480 0 0
Watford Engineering Works	475 0 0
Joel & Co. and Potter & Sons, United, Ltd.	459 10 0
Defries & Sons	448 0 0
T. Cole	432 0 0
J. & F. May	410 0 0
Reed & Sons, Ltd.	403 18 6
G. Fawley & Son, Ltd., Saville Park, Halifax*	386 8 6

[Engineer's estimate, £350.]

SWINDON.—For the erection of a detached residence in Westlecott-road, for Mr. W. O. Hill. Messrs. William Drew & Sons, architects, Regent Circus, Swindon. Quantities by the architects:—

J. Williams	£1,530 0 0	C. Hunt	£1,258 15 7
Tydeman Bros.	1,300 0 0	J. G. Norman*	1,250 1 3
A. J. Colborne	1,264 0 0		

WEDNESBURY.—For the electric lighting of public buildings, for the Corporation, Mr. F. J. Warden-Stevens, Consulting Engineer, 34, Victoria-street, Westminster, S.W.:—

Town Hall, Municipal Offices, Art Gallery, Public Baths, and Public Library.

W. Preston, Junr.	£657
Whittaker Bros.	624
Alliance Electrical Co.	567
Birmingham Installation Co.	529
Arundale & Robottom	492
Edwards & Armstrong	480
National Electric Construction Co., Ltd., London and Wolverhampton*	465

Electricity Sub-Station.

Carpenter & Mayfield	£60
National Electric Construction Co., Ltd.	59
Ross, Price, & Co.	58
Edwards & Armstrong	52
Whittaker Bros.	52
Arundale & Bobottom	45
W. Preston, Junr., Wednesbury*	40

WEDNESFIELD.—For construction of foul sewer, Vicarage-road, for the Urban District Council. Mr. R. E. W. Berrington, Engineer, Bank Buildings, Wolverhampton:—

R. Moss	£232 15 0	H. Holloway	£200 6 0
Currall, Lewis, & Martin	226 10 0	W. H. Reading	195 0 0
T. Allsopp	223 0 0	J. Owens, Wolverhampton*	191 12 0
Tary & Son	217 12 3		

LONDON SCHOOL BOARD TENDERS.

AT the last meeting of the London School Board the Works Committee submitted the following lists of tenders:—

The interior cleaning at the following schools will be executed between 19th December, 1903 and 9th January, 1904:—

BAILEY'S-LANE:—

H. Runham Brown	£189 10	J. Haydon & Sons	£144
Barrett & Power	179 0	A. Porter	128
J. Stewart	158 5	W. Silk & Son*	107
F. Bull	153 10		

BATH-STREET (B, G, I, & Special):—

Patman & Fotheringham, Ltd.	£377 0	Gavin Bros.*	£285 10
Belcher & Co., Ltd.	358 0	Marchant & Hirst	276 0
H. Runham Brown	286 0	Stevens Bros.	275 0
		Parrott & Isom	224 0

BOW-CREEK:—

A. J. Sheffield	£105 0	Vigor & Co.	£81 10 0
A. W. Derby	100 0	W. Banks*	64 19 6
R. Woollaston & Co.	83 10		

CAMDEN-STREET (old portion):—

Viney & Stone	£265	*Thompson & Beveridge	£208
T. Cruwys	250	Marchant & Hirst	194
H. Wall & Co.	212		

CANTERBURY-ROAD (J.M. & Schoolkeeper's house):—

Bargman, Son & Co.	£124 0	W. V. Goad	£108 0
H. J. Williams	118 10	W. J. Howie	102 0
Rice & Son	111 0	W. Sayer & Son*	100 0

CAPLAND-STREET:—

T. Cruwys	£295	Holloway Bros. (London), Ltd.	£242
Thompson & Beveridge	266	W. Densham & Sons*	209
W. Chappell	£195.		

COBOURG-ROAD:—

H. J. Williams	£363 0	H. Line	£300 0
Maxwell Bros., Ltd.	355 0	E. Triggs	270 0
Rice & Son	343 15	W. Sayer & Son*	264 0

COMPTON-STREET:—

Parrott & Isom	£345 0	Marchant & Hirst	£237 0
Patman & Fotheringham, Ltd.	315 0	Gavin Bros.	234 17
Belcher & Co., Ltd.	265 0	Stevens Bros.*	198 0
Greenwood, Ltd.	254 0	C. & W. Hunnings	193 11

COTTENHAM-ROAD:—

Patman & Fotheringham, Ltd.	£345 0	G. Kirkby	£265 0
Bate Bros.	320 0	C. & W. Hunnings	233 15
J. Stewart	298 5	Stevens Bros.	223 0
		Marchant & Hirst*	226 0

DEAL-STREET:—

Wollaston Bros.	£248 0	R. Wollaston & Co.	£210 0
A. W. Derby	231 0	Vigor & Co.	184 15
J. Haydon & Sons*	£177 15		

GIPSY-ROAD (B., G., I., & J. M.):—

Maxwell Bros., Ltd.	£289 4	Leney & Son	£230 0
G. Kemp	255 0	J. & C. Bowyer	215 0
C. G. Jones	249 0	Lathey Bros.*	199 0
A. J. Acworth	235 0	M. E. Allen	113 10

GLOBE-TERRACE:—

W. Shurmur & Sons, Ltd.	£375	F. Bull	£251
W. Silk & Son	345	Barrett & Power	249
H. Bouneau	265	Woolaston Bros.	238
		Collis Willmott & Son*	230

HUNGERFORD-ROAD:—

Patman & Fotheringham, Ltd.	£314 0	H. Bouneau*	£271 0
Thompson & Beveridge	286 0	Stevens Bros.	267 0
		Marchant & Hirst	257 0
		C. & W. Hunnings	227 10

KENDER STREET:—

W. Hayter & Son	£355	Holliday & Greenwood, Ltd.	£176
W. J. Howie	221	G. Kemp*	160
E. P. Bulled & Co.	184		

LATIMER-ROAD:—

Macey & Sons, Ltd.	£342 4 3
General Builders, Ltd.	273 0 0
Holloway Bros. (London), Ltd.	211 0 0
F. Chidley & Co.	169 10 0
W. Brown & Sons	137 10 0
W. R. & A. Hide*	136 10 0

[*See also next page.*

MONTEM-STREET:—

Patman & Fotheringham, Ltd.	£559 0	McCormick & Sons	£383 0
C. & W. Hunnings	398 18	Stevens Bros.*	340 0
G. Kirby	383 0	Marchant & Hirst	339 0

OLDRIDGE-ROAD:—

Hudson Bros.	£313 0	Leney & Son	£251 0
Williams & Sons	300 0	Rice & Son	238 0
Johnson & Co., Ltd.	295 0	Garrett & Son*	214 0
W. Read	294 14		

ST. ANDREW'S-STREET:—

J. R. Sims	£279	E. B. Tucker	£260 11
J. & M. Patrick	278	R. S. Ronald	250 0
Johnson & Co., Ltd.	277	Lathey Bros.	215 0
Rice & Son	269	Garrett & Son*	206 0

SHILLINGTON-STREET:—

J. & M. Patrick	£353	E. Triggs	£240
C. Gurling	300	Martin, Wells & Co., Ltd.	235
Williams & Sons	265	Garrett & Son*	219
Curd & Sons	250		

SLADE (except portion affected by new sanitary work):—

W. Hayter & Son	£299 10	J. Garrett & Son	£237 0
Holliday & Greenwood, Ltd.	279 0	H. Groves	216 0
W. Hornett	260 0	P. S. Howard*	196 10

SOUTHWARK-PARK (old and new portions):—

Holloway Bros., (London), Ltd.	£262 0	E. Triggs	£227 0 0
H. J. Williams	234 0	W. Banks	219 17 6
John Greenwood, Ltd.	232 13	W. Sayer & Son	207 0 0
		W. Hooper*	183 10 0

THORNHILL-ROAD:—

Dearing & Son	£388	Grover & Son	£294 0
McCormick & Sons	368	C. & W. Hunnings	292 6
Patman & Fotheringham, Ltd.	355	Marchant & Hirst	291 0
Williams & Son	333	Stevens Bros.	283 0
		F. W. Harris*	239 0

UPPER KENNINGTON-LANE:—

W. Downs	£303 0	W. Read	£227 17
J. F. Ford	233 0	Maxwell Bros., Ltd.	216 0
E. B. Tucker	229 6	Rice & Son	196 0
E. Triggs*	£179.		

WALLER-ROAD (old and new portions):

G. Kemp	£8[illegible] 0	J. & C. Bowyer	£159
W. Read	178 11	H. Groves	139
W. Banks	175 0	M. E. Allen*	107
C. G. Jones	169 8		

WESTMINSTER BRIDGE-ROAD:—

Macey & Sons, Ltd.	£278 6 9	Rice & Son	£219 0
W. V. Goad	267 0 0	J. R. Sims	207 0
J. F. Ford	252 0 0	H. J. Williams*	199 0
Holloway Bros. (London), Ltd.	223 0 0		

WESTVILLE-ROAD:—

C. F. Kearley	£368 10	W. Hornett	£274 0
General Builders, Ltd.	358 0	G. H. Sealy	241 10
S. Polden	358 0	W. R. & A. Hide	218 0
		W. Brown & Sons*	210 19

YORK-ROAD:—

Patman & Fotheringham, Ltd.	£304 0		
J. Stewart	280 9		
Viney & Stone	273 0		
W. Hornett	261 10		
Thompson & Beveridge	237 0		
Holloway Bros. (London), Ltd.	221 0		
G. S. S. Williams & Son	208 10		
W. Chappell*	185 0		

The interior cleaning of the following Schools will be executed between 19th December, 1903, and 9th January, 1904; and the exterior painting (if any) between 31st March and 28th April, 1904:—

BERGER-ROAD—Except portion affected by new sanitary work:—

F. Bull	£425 0	H. Bouneau	£280 0
Shurmur & Sons, Ltd.	397 10	Barrett & Power*	272 0
J. Stewart	381 11	Woollaston & Co.	244 0
Silk & Son	360 0	Belcher & Co., Ltd.	230 0

CREED-PLACE—Also painting:—

Hayter & Son	£654 10	Harry Groves	£419 0 0
W. J. Howie	454 0	S. E. Musgrove	410 15 10
G. Kemp	440 0	C. G. Jones*	391 4 6
Holliday & Greenwood, Ltd.	429 0	Woollaston & Co.	383 0 0

"OLD PALACE":—

A. J. Sheffield	£220	J. F. Holliday	£176 0
A. E. Symes	219	H. Bouneau	175 0
A. W. Derby	182	Woollaston & Co.*	146 10

ST. JOHN'S-ROAD:—

F. Bull	£639 0	Grover & Son	£444 0
Shurmur & Sons, Ltd.	605 10	H. Bouneau	435 10
Silk & Son	540 10	Williams & Sons	434 0
Gavin Bros.	480 7	Haydon & Sons*	356 16

THOMAS-STREET—B., G., I. and J.M.:—

A. W. Derby	£397	J. F. Holliday	£372 10
A. J. Sheffield	386	A. E. Symes	370 0
Woollaston & Co.	376	Vigor & Co.	328 10
		Woollaston Bros.*	240 0

VITTORIA-PLACE—Also painting:—

Macey & Son, Ltd.	£650 10	Gavin Bros.	£520 10 0
Barratt & Power	569 0	G. Kirby	498 5 0
Patman & Fotheringham, Ltd.	564 0	A. Porter*	496 0 0
Dearing & Son	547 0	Stevens Bros.	477 0 0
		Woollaston Bros.	456 0 0

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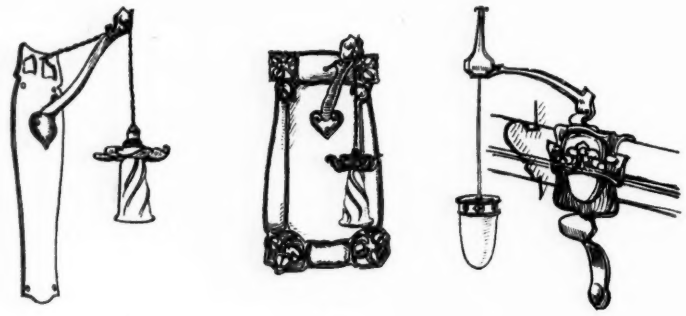

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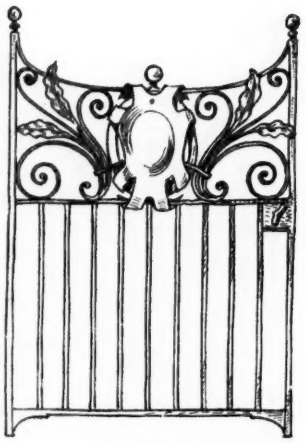

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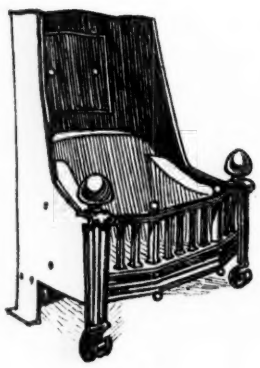

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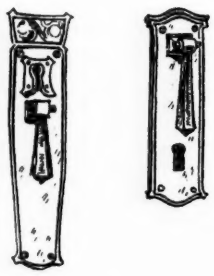

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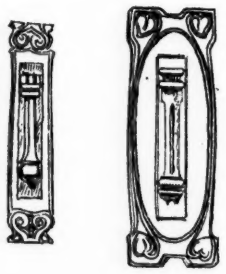

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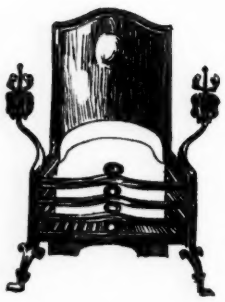

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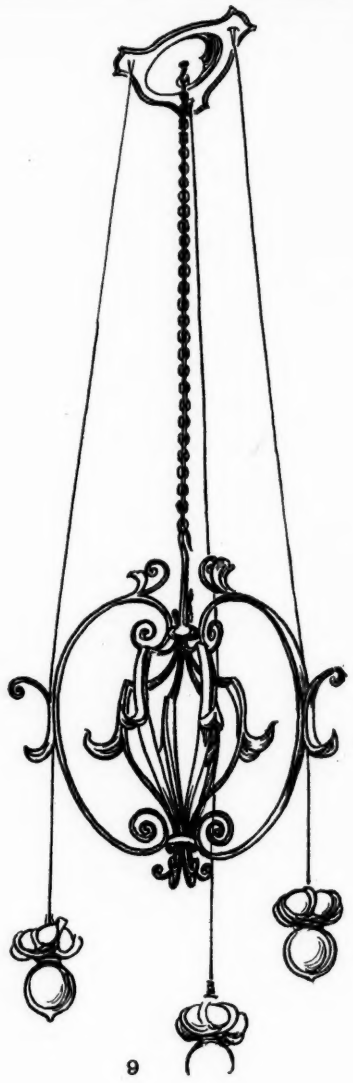

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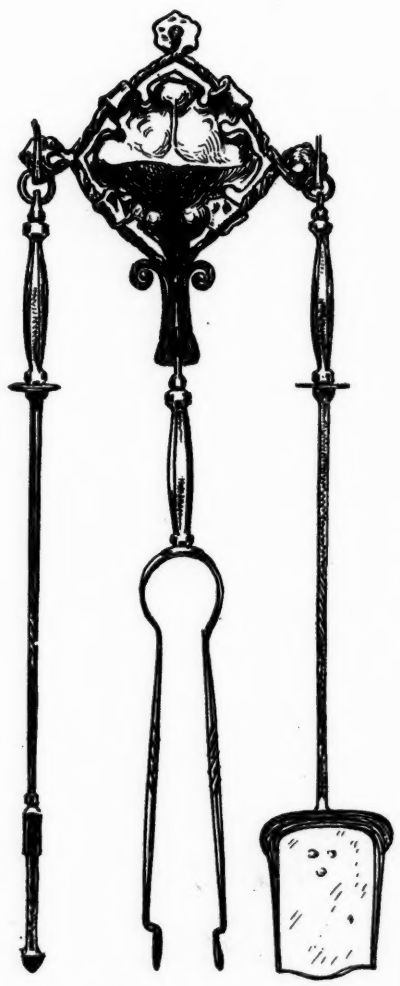

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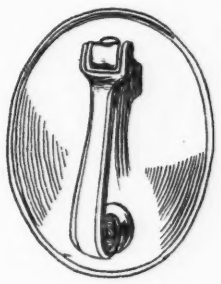

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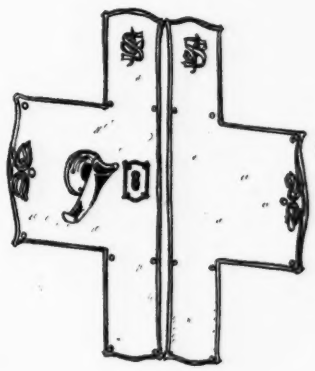

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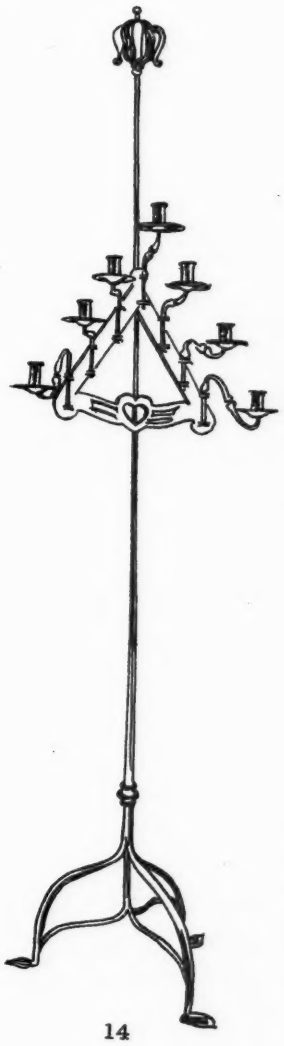

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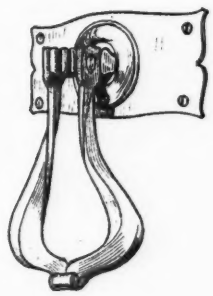

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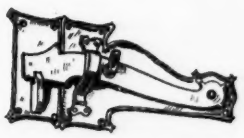

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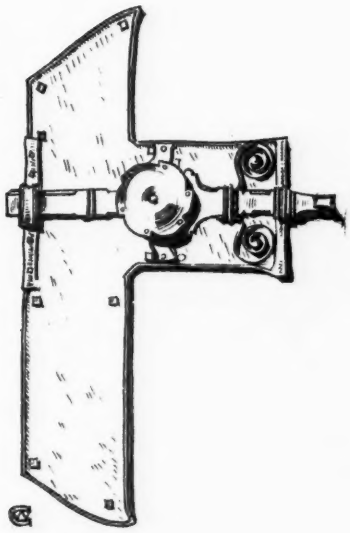

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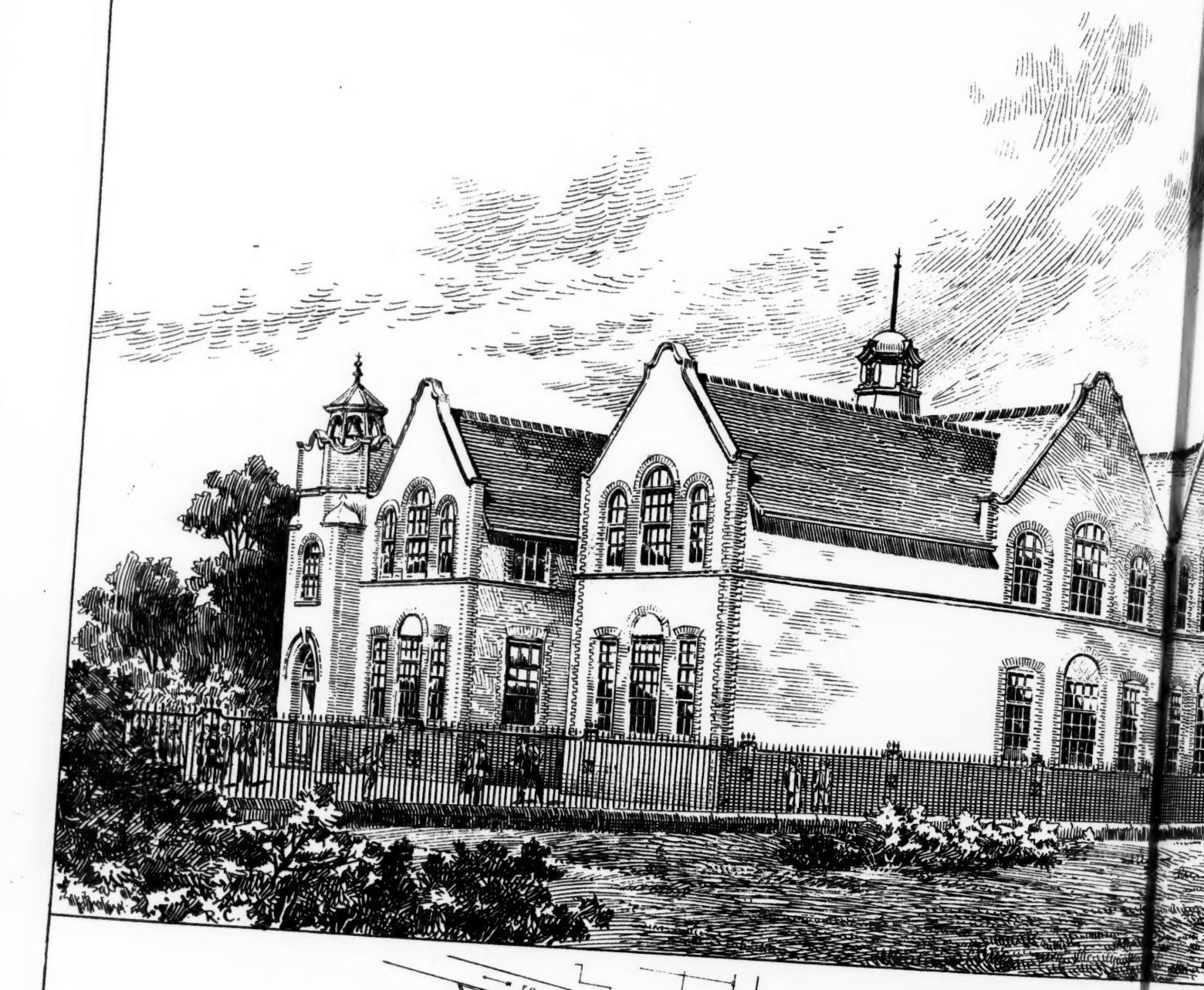

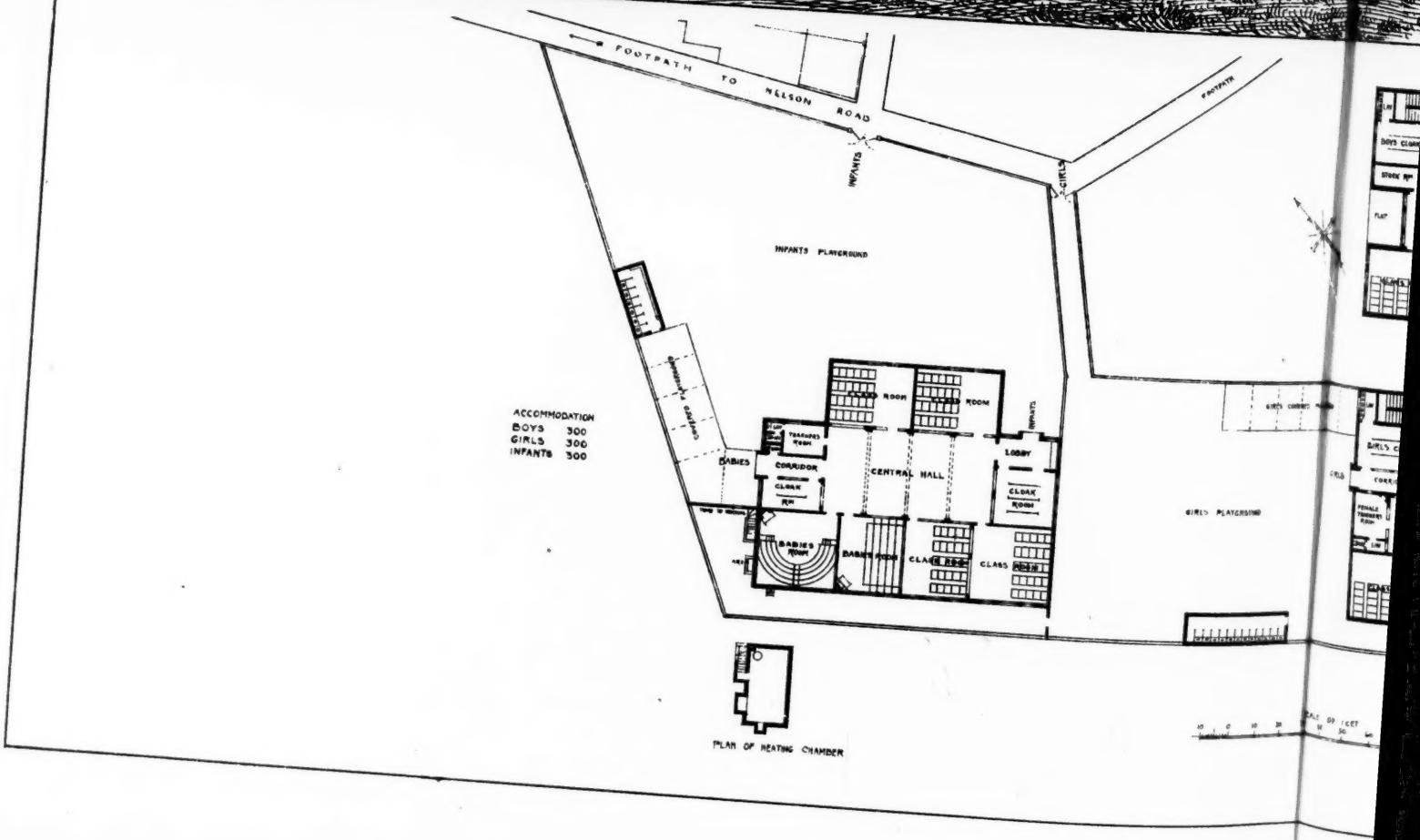

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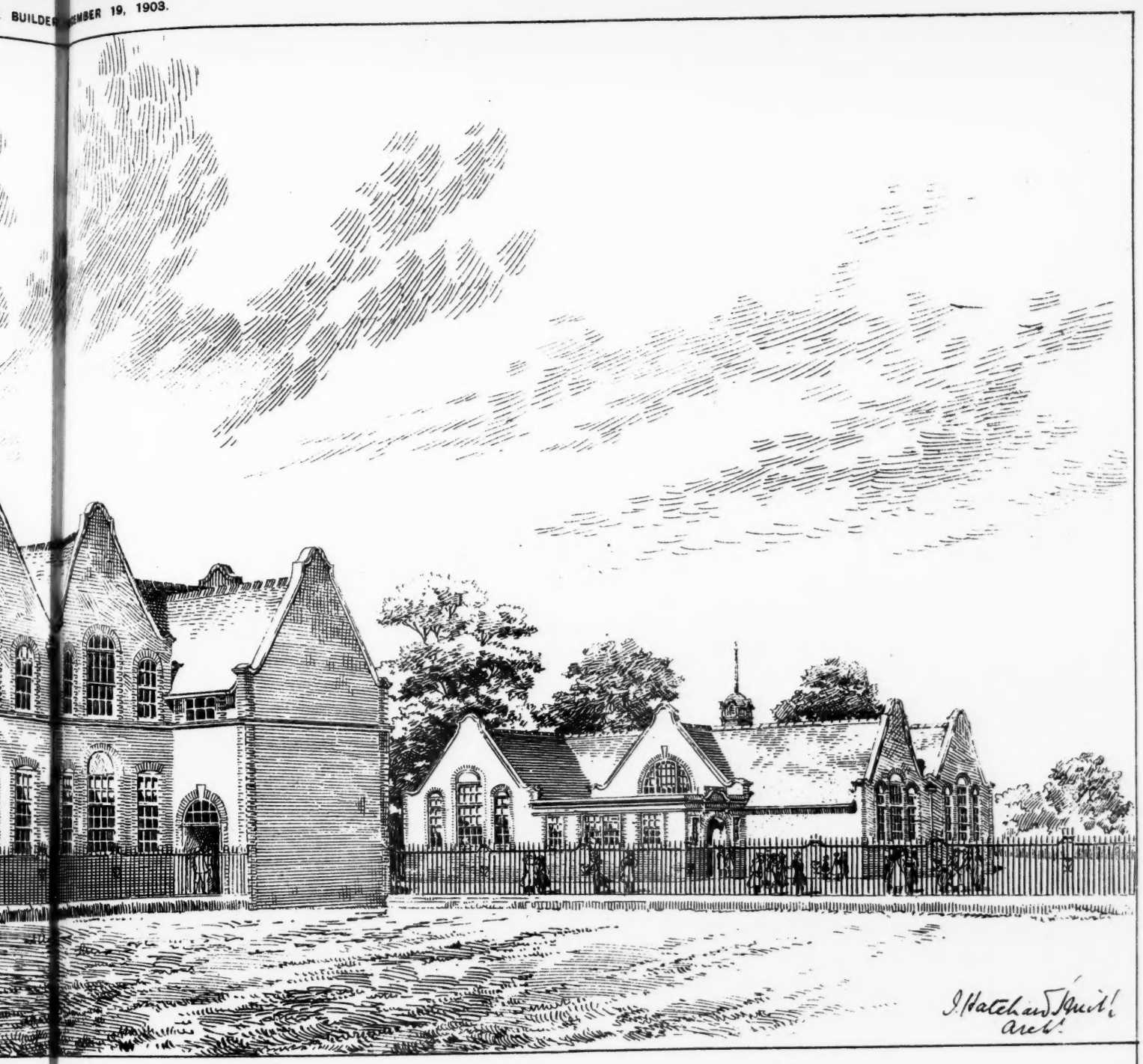

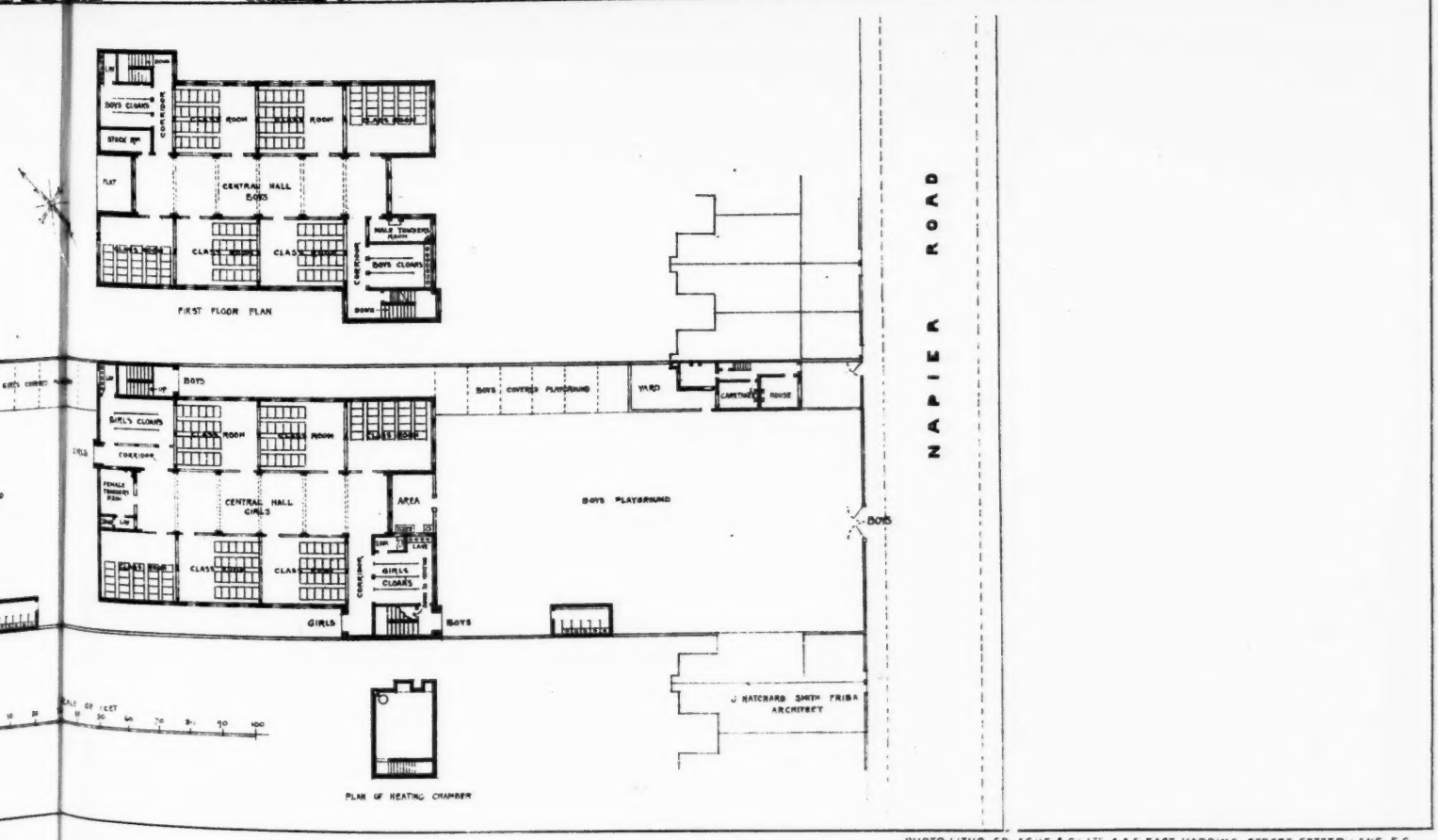

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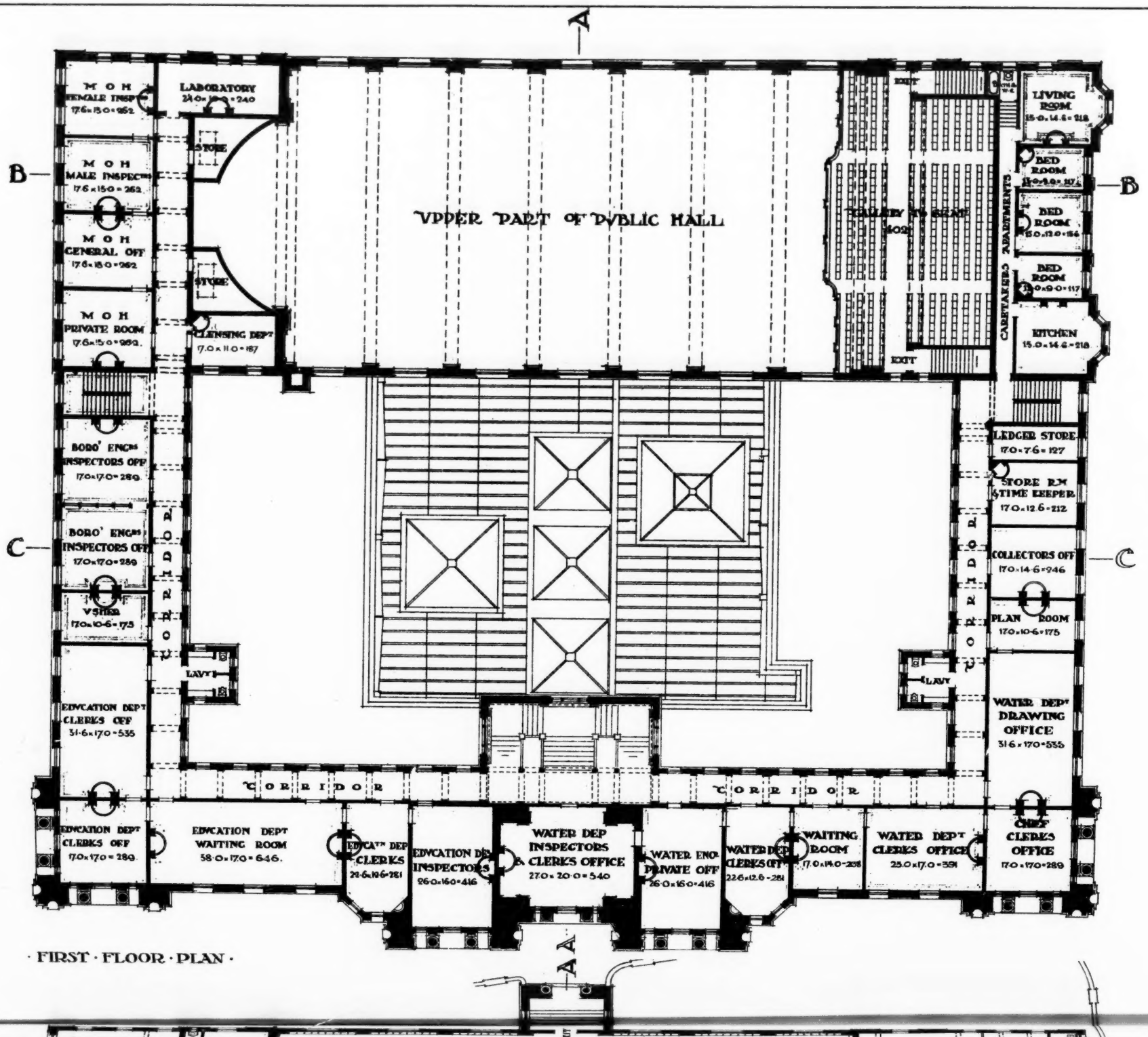

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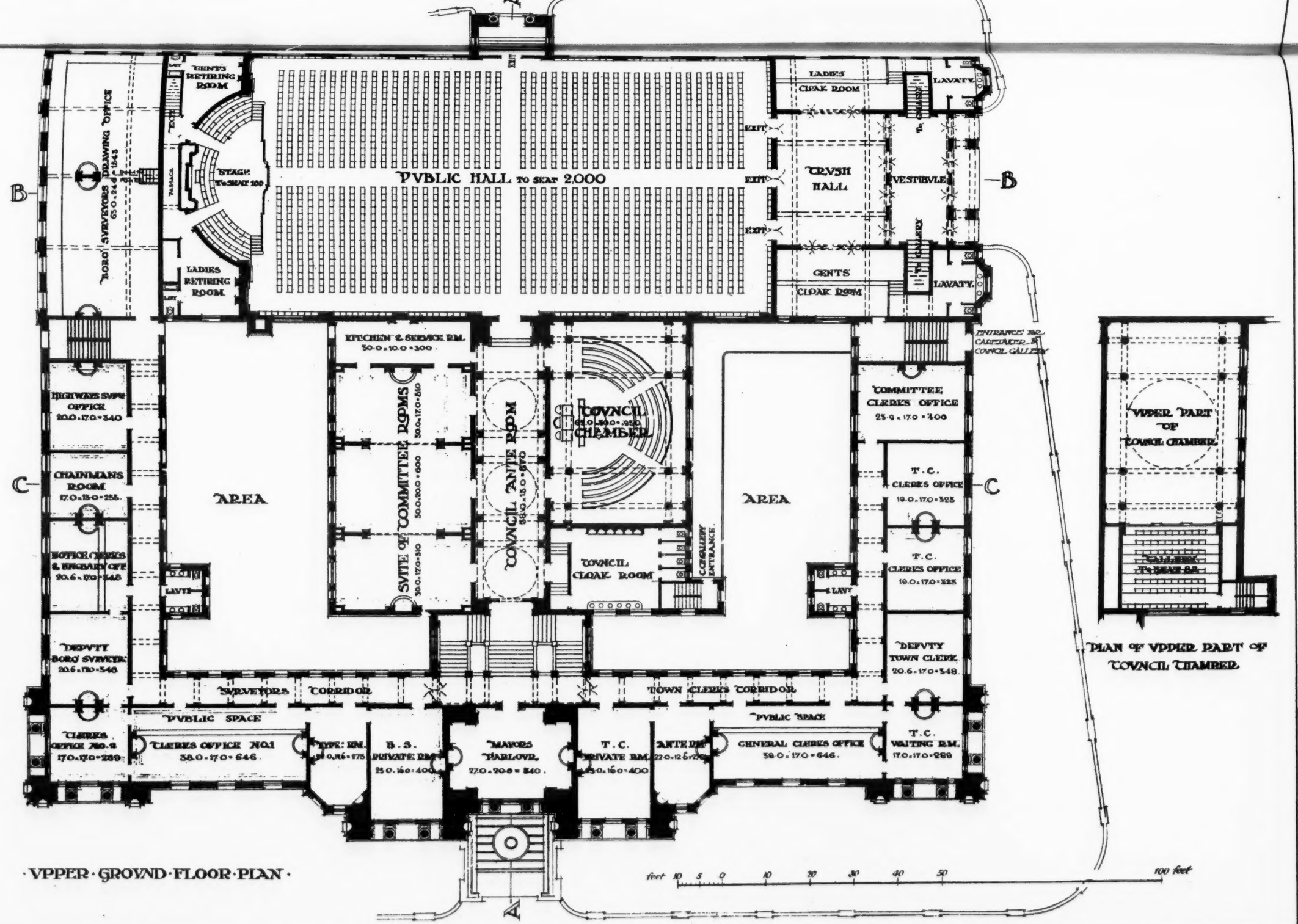

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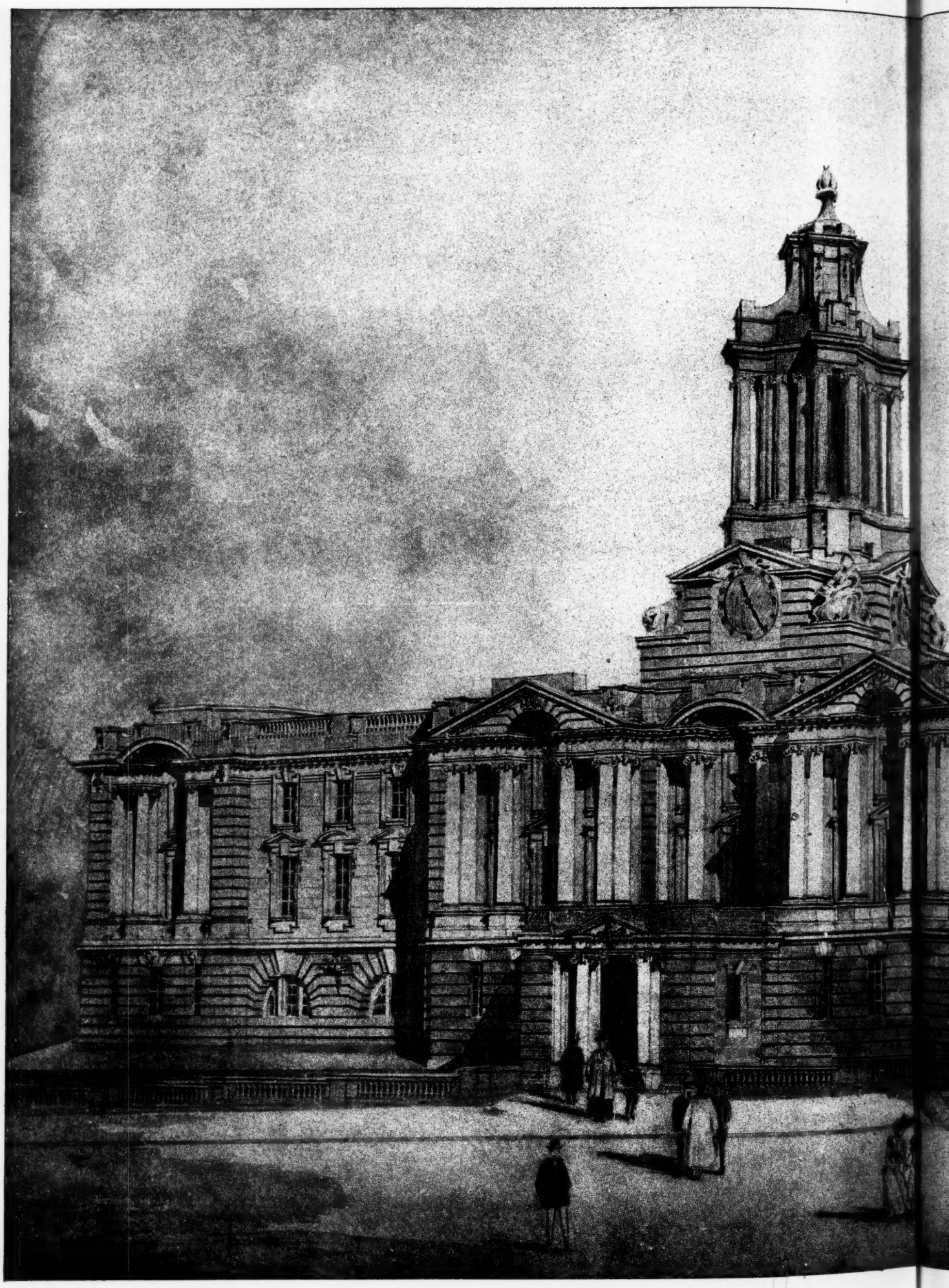

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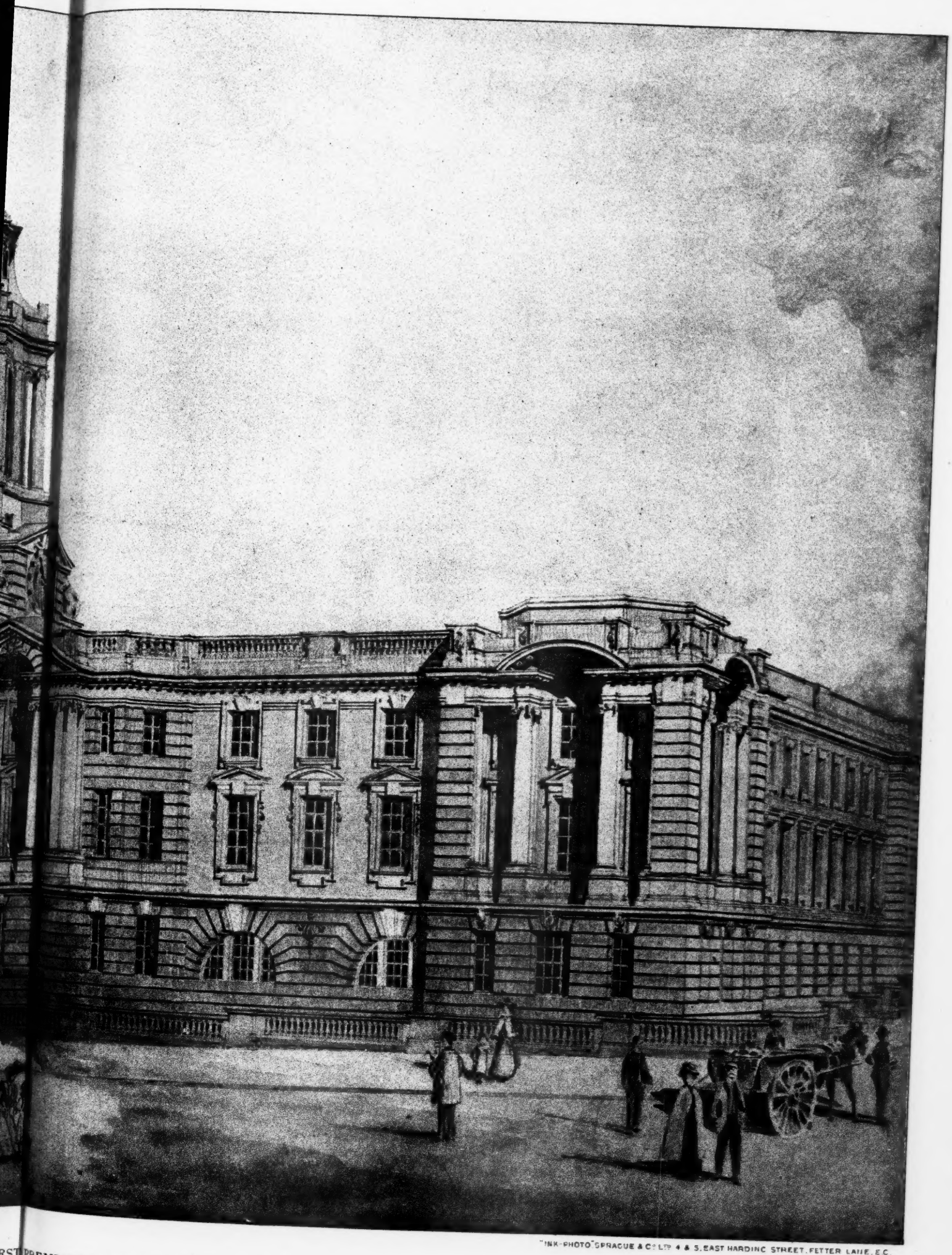

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